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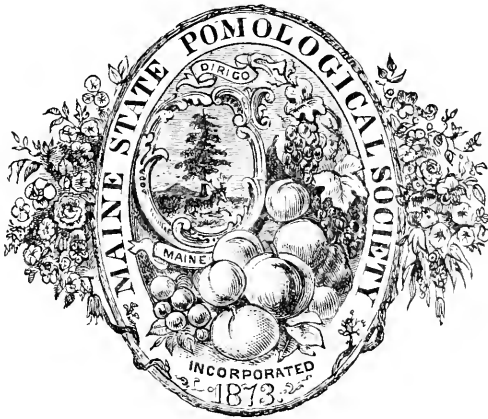


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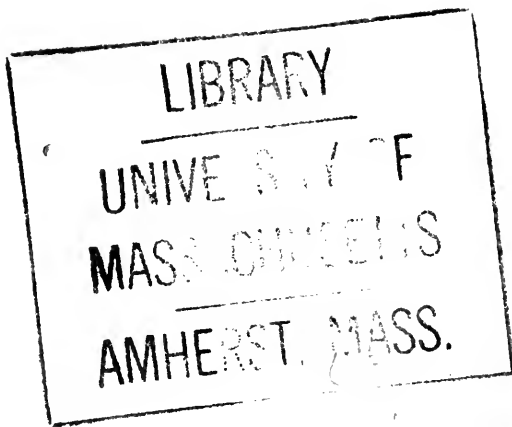
TRANSACTIONS
OF THE
Maine State Pomological Society,
FOR THE YEAR 1889.

Including the Proceedings of the Union Winter Meeting held in
Patrons' Hall, Norway, February 4, 5 and 6, 1890.



EDITED BY THE SECRETARY,
D. H. KNOWLTON.

AUGUSTA:
BURLEIGH & FLYNT, STATE PRINTERS.
1890



“The apple is the commonest and yet the most varied and beautiful of fruits. A dish of them is as becoming to the center table in winter as was the vase of flowers in the summer, * * * * a rose when it blooms, the apple is a rose when it ripens. It pleases every sense to which it can be addressed, the touch, the smell, the sight, the taste; and when it falls in the still October days it pleases the ear. It is a call to a banquet; it is a signal that the feast is ready.”

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MAINE STATE POMOLOGICAL SOCIETY.

Transactions for the Year 1889-90.

It has been a source of pleasure to the writer, as he has hastily reviewed the work of our Society, to note how faithfully its early officers devoted themselves to the interests of fruit culture in this State. Since its organization in 1873, it has been the principal organized agency in the promotion of fruit culture. It has brought fruit growers together, it has spread out before the public beautiful displays of fruits and flowers; but the chief work of the Society has been in the dissemination of a practical knowledge of fruit raising. This knowledge is twofold in its character; on the one hand it has aimed at the raising of fruit as a home luxury—a luxury which every man who controls a foot of ground owes to himself and family; on the other hand it has been the object of the Society to recognize and promote the raising of fruit in our State as one of the most profitable of our agricultural industries. In the early days of our Society there were only local markets for our fruit, the surplus going, as a rule, only so far as Boston and surrounding towns. To-day, in extent and importance, fruit raising has become one of the leading features of Maine farming and not alone are our apples sought for in our home markets, but foreign buyers seek them for shipment to the cities of the old world.

The year 1888 was not generally regarded as a profitable apple year in the State, and yet a small orchard under the shadow of Mt. Blue, where twenty-five years ago few men would have ventured to set trees at all, the industrious owner received over \$400 for his apples, and the 1889 crop will net him more than this. Along side this farm are thousands of acres of land which are used only as sheep pastures and woodlots. In another section of the same county, not

many years ago a gentleman bought ninety acres of old, rocky pasture and woodland for \$400, paying down \$75 for the same which represented his assets at the time. On this land there were about seventy worthless old apple trees. Not over five or six acres of the land had ever been plowed, and a large portion of it is so rocky and steep it never can be. Here he began his work as an orchardist, and he has followed it up faithfully. Under his manipulation he has developed one of the most productive fruit farms in the State. For the past ten years he has been thriving and well he may, for ear load after ear load of fruit has been taken from that \$400 lot of land. From the inferior fruit he has produced enough evaporated apples to meet all the expense connected with his orchard. He has erected new buildings, a large fruit house and paid all his bills. In 1888-9 there was a large surplus of evaporated apples in the markets and prices were low, but our friend had money enough, and so he kept right on evaporating the Nos. 2 and 3 apples, until he had in the store house two years' crop (about twelve tons) which found a market from nine to twelve cents per pound. Yet there are some who claim evaporating fruit in Maine does not pay. The 1889 crop of fruit will net this enterprising farmer not less than \$3,000, and the reader may draw his own conclusions.

These are only instances with which the writer is familiar. There are others quite as notable in the State; but that to which we wish to call especial attention is the grand opening orcharding in Maine offers to the capitalists. Thousands of dollars have been sent to Florida and California to be used in fruit raising, but the facts clearly show that Maine orcharding will pay larger dividends. These instances are given here as illustrative of organized orcharding which is referred to in sections of this volume.

The general work of the Society the past year has been similar to that of former years. As early as the dates for the annual fair were determined, and other matters connected with it could be arranged, a special circular was issued to Maine fruit growers. The object of this circular was to furnish advance sheets of the Society's revised fruit list, and in addition to this, several important announcements were made relating to the fair. This circular was deemed of sufficient importance to be published entire by the *Maine Farmer* and *Lewiston Journal*. Something of this sort issued annually is of great assistance to fruit growers and at the same time reminds the public of the work the Society is doing. It

also suggests that the Society deserves the active co-operation of all interested in the welfare of the State. If its membership could be doubled, its usefulness could largely be increased.

So far as possible it is the intention of the officers of the Society to make its work aggressive, firmly believing the industry it represents to be in its infancy. With this in view they have had a wide correspondence with fruit growers and the officers of other societies. They have also by all means possible endeavored to advance sound business principles in growing fruit and in preparing the same for market. They realize the importance of establishing a reputation for Maine apples in the markets of the world, and with this in view, they have urged the growing of the best varieties in the best manner and the most careful packing of the fruit before it leaves the farm. Should their ideas prevail, they believe the buyer would need no other guaranty than that the fruit he was buying was grown and packed by an honest Maine fruit grower. The officers have also endeavored to cultivate pleasant, social intercourse among fruit growers at their various public gatherings. The results have been very gratifying.

The present volume is arranged similar to that of the previous year, so that as far as possible the business transactions are placed together, the papers and discussions offered at the meetings being arranged not in the order of presentation but rather with reference to their subjects.

It would be of great assistance to the officers of the Society if the fruit growers of Maine would send them items of interest relating to fruit culture. The possibilities of this industry are not yet understood by the public, nor are they fully comprehended by our farmers. Information sent to the Secretary, stating the results of fruit growing would be very helpful, for as yet we have had no statistics bearing on fruit culture. It is also a pleasure to the officers of the Society to hear from those who desire information upon fruit subjects, for they are frequently able to render the inquirers a valuable service.

D. H. K.

OFFICERS FOR 1890.

President.

CHARLES S. POPE, Manchester.

Vice Presidents.

S. H. DAWES, Harrison.

O. C. NELSON, New Gloucester.

Secretary.

D. H. KNOWLTON, Farmington.

Treasurer.

A. S. RICKER, Turner.

Executive Committee.

The President and Secretary, *ex-officio*; H. W. Brown, Newburg; L. H. Blossom, Turner Centre; J. W. True, New Gloucester.

Trustees.

Androscoggin County,	I. T. Waterman, East Auburn.
Aroostook	" J. W. Dudley, Castle Hill.
Cumberland	" S. R. Sweetser, Cumberland Centre.
Franklin	" M. C. Hobbs, West Farmington.
Hancock	" F. H. Moses, Bucksport.
Kennebec	" E. A. Andrews, Gardiner.
Knox	" Elmas Hoffs, Warren.
Lincoln	" H. J. A. Simmons, Waldoboro'.
Oxford	" C. H. George, South Paris.
Penobscot	" S. C. Harlow, Bangor.
Piscataquis	" H. L. Leland, East Sangerville.
Sagadahoc	" H. S. Cary, Topsham.
Somerset	" James S. Hoxie, North Fairfield.
Waldo	" D. B. Johnson, Freedom.
Washington	" Dr. A. R. Lincoln, Dennysville.
York	" B. F. Pease, Cornish.

Member of Experiment Station Council.

D. H. Knowlton, Farmington.

Committee on Nomenclature.

Z. A. Gilbert, North Greene; W. P. Atherton, Hallowell; D. P. True, Leeds Centre.

Committee on New Fruits.

D. H. Knowlton, Farmington; L. H. Blossom, Turner; J. W. True, New Gloucester.

Committee on Revision of Fruit List.

D. H. Knowlton, Farmington; D. J. Briggs, South Turner; D. P. True, Leeds Centre; Henry McLaughlin, Bangor; E. W. Dunbar, Damariscotta.

MEMBERS OF THE SOCIETY.

NOTE—Any errors or changes of residence should be promptly reported to the Secretary. Members will also confer a favor by furnishing the Secretary with their full Christian names where initials only are given.

LIFE MEMBERS.

Andrews, A. Emery.....	Gardiner	Harris, N. W.	Auburn
*Atherton, H. N.	Hallowell	Harris, William M.	Auburn
Atherton, Wm. P.	Hallowell	*Hersey, T. C.	Portland
Atkins, Charles G.	Bucksport	Hobbs, M. Curtis.	West Farmington
Atwood, Fred.	Winterport	Hoffses, Elmas.	Warren
Averill, David C.	Temple	Hopkins, Miss S. M.	Gardiner
Bennoch, John E.	Orono	Hoxie, James S.	North Fairfield
Boardman, Samuel L.	Augusta	Hoyt, Mrs. Francis.	Winthrop
Briggs, D. J.	South Turner	Ingalls, Henry ..	Wiscasset
Briggs, John ...	Turner	Jackson, F. A.	Winthrop
Burr, John.	Freeport	*Jewett, George.	Portland
Butler, Alonzo.	Union	Johnson, Isaac A.	Auburn
Carter, Otis L.	Etna	Jordan, Francis C.	Brunswick
Chase, Henry M.	North Yarmouth	Kenniston, E. H.	Arnold
Chase, Martin V. B.	Augusta	Knowlton, D. H.	Farmington
*Clark, Eliphalet.	Portland	Lapham, E. A.	Pittston
Cole, Horatio G.	Boston, Mass	Low, Elijah.	Bangor
Crafts, Moses.	Auburn	Low, S. S.	Bangor
*Crosby, William C.	Bangor	McLaughlin, Henry.	Bangor
Dana, Woodbury S.	Portland	Merrill, T. M.	West Gloucester
Dawes, S. H.	Harrison	*Metcalf, M. J.	Monmouth
DeRocher, Peter.	Bradentown, Fla.	Moore, William G.	Monmouth
Dirwanger, Joseph A.	Portland	Moor, F. A.	Waterville
Dunham, W. W.	North Paris	Morton, J. A.	Bethel
Dyer, Milton.	Cape Elizabeth	Morton, William E.	Portland
*Emerson, Albert.	Bangor	*Noyes, Albert.	Bangor
Farnsworth, B. B.	Portland	Perley, Chas. I.	Seward's (Vassalboro')
Frost, Oscar F.	Monmouth	Pope, Chas. S.	Manchester
*Gardiner, Robert H.	Gardiner	Pulsifer, D. W.	Poland
Gardiner, Robert H.	Boston, Mass.	Purington, E. F.	West Farmington
George, C. H.	Hebron	*Richards, F. G.	Gardiner
Gilbert, Z. A.	North Greene	Richards, John T.	Gardiner
*Godfrey, John E.	Bangor	*Richardson, J. M.	Gardiner
Hackett, E. C.	West Gloucester	Ricker, A. S.	Turner
Hanscom, John.	Saco	Roak, George M.	Auburn
Harlow, S. C.	Bangor	Robinson, Henry A.	Foxcroft
*Harris, N. C.	Auburn	Rolfe, Samuel.	Portland

*Deceased.

LIFE MEMBERS—CONCLUDED.

Sawyer, Andrew S.	Cape Elizabeth	Sweetser, S. R.	Cumberland Center
Sawyer, George B.	Wiscasset	*Taylor, Joseph	Belgrade
Shaw, Stillman W.	West Auburn	Taylor, Miss L. L.	(Lakeside) Belgrade
Simmons, H. J. A.	Waldoboro'	Thomas, William W. Jr.	Portland
*Smith, Alfred	Monmouth	Tilton, William S.	Boston, Mass
Smith, Henry S.	Monmouth	True, Davis P.	Leeds Center
Starrett, L. F.	Warren	Varney, James A.	The Dalles, Oregon
*Stetson, Isaiah	Bangor	Vickery, James.	Portland
Stilphen, Asbury C.	Gardiner	Vickery, John.	Auburn
Stanley, Charles.	Winthrop	Wade, Patrick.	Portland
Stanley, O. E.	Winthrop	*Weston, James C.	Bangor
Staples, G. K.	Temple	Wharff, Charles S.	Gardiner
Strout, S. F.	West Falmouth	Whitney, Edward K.	Harrison
Strattard, Mrs. A. B.	Monroe	Woodman, George W.	Portland

ANNUAL MEMBERS, 1889.

Arnold, C. A.	Arnold	Hopkins, John.	Newcastle
Bailey, W. G.	Freeport	King, S. M.	South Paris
Bartlett, Bradford W.	East Dixmont	Leech, H. T. & S. E.	East Monmouth
Bartlett, M. E.	East Dixmont	Lombard, T. M.	Auburn
Beals, Laura B.	Turner	Luce, Willis A.	South Union
Blossom, L. H.	Turner Center	Merritt, E. W.	Houlton
Brown, H. W.	Newburg	Merrow, J. H.	South Smithfield
Carey, Henry S.	Topsham	Nelson, O. C.	Upper Gloucester
Chandler, Lucy A.	Freeport	Nowell, F. E.	North Fairfield
Chandler, S. H.	New Gloucester	Osgood, A. J.	Cumberland Centre
Chase, F. C.	South Etna	Perkins, L. J.	Portland
Chase, Geo. C.	Lewiston	Pike, George A.	Winthrop
Davis, Jacob L.	Upper Gloucester	Pope, Miss L. M.	Manchester
Dudley, J. W.	Castle Hill	Pope, J.	Manchester
Dunbar, E. W.	Damariscotta	King, A. P.	Richmond
Fuller, Mrs. H. W.	Readfield	Ring, Cora E.	Richmond
Farwell, S. L.	Cumberland Center	Rogers, F. A.	North Newburg
Goodrich, A. N.	Allen's Mills	Stanley, Cora.	Winthrop
Gorden Bros.	New Sharon	Stetson, Everett W.	Damariscotta
Grant, Mrs. Benson.	Lewiston	Tarr, Edward.	Castle Hill
Greenleaf, A. C.	Farmington	Towle, Willis O.	West Gardiner
Gurney, Lemuel.	Hebron	Waterman, Mrs. Elbert.	East Auburn
Haley, John E.	Forest City	Waterman, Mrs. W. H.	East Auburn
Hawkins, M. P.	Auburn	Wharff, W. R.	Gardiner
Hoffses, Elmas.	Warren	Wright, Fred.	Bath

ANNUAL MEMBERS, 1890.

Blossom, L. H.	Turner Centre	Nelson, O. C.	Upper Gloucester
Brown, H. W.	Newburg	True, J. W.	New Gloucester
Dudley, J. W.	Castle Hill	Weston, C. M.	Belgrade
Harvey, F. L.	Orono	Whittier, Phineas.	Farmington Falls

*Deceased.

ANNUAL STATEMENT OF THE MAINE STATE POMOLOGICAL SOCIETY FOR THE YEAR ENDING DECEMBER 31, 1889.

RECEIPTS.

Amount in treasury Dec. 31, 1888	\$ 61 46	
Cash from loan—Manufacturers' National Bank	250 00	
State Treasurer, bounty, 1888.	500 00	
life members.	50 00	
annual members	50 00	
State Agricultural Society for 1888.	50 00	
1889.	500 00	
premiums from Bay State Fair	57 00	
interest on permanent fund	14 87	
	<hr/>	\$1,533 33

EXPENDITURES

Cash paid on Secretary's salary.	\$25 00	
expenses.	49 92	
to " clerk.	8 00	
on Executive Committee's expenses.	117 77	
for stationery, printing and binding.	26 15	
Fruit Catalogue Committee	13 00	
Treasurer's expenses, 1888.	16 50	
use of hall, winter meeting	18 00	
A. J. Tolman.	4 00	
loan on Manufacturers' National Bank.	400 00	
interest " " "	2 67	
W. W. Rawson.	20 00	
Bay State Fair expenses.	25 82	
exhibition plates.	12 70	
Wiscasset Savings Bank in favor of permanent fund,	60 00	
interest on " "	14 87	
discount, Manufacturers' National Bank, note	3 88	
premiums.	616 00	
in treasury	99 05	
	<hr/>	\$1,533 33

FINANCIAL CONDITION OF THE SOCIETY DECEMBER 31, 1889.

ASSETS.

Due from State Treasurer, bounty for 1889.	\$500 00	
Property owned by society, estimated	150 00	
Permanent fund deposit.	440 72	
Amount in treasury	99 05	
	<hr/>	\$1,189 77

LIABILITIES.

Due Manufacturers' National Bank, note	\$250 00	
Outstanding accounts	85 00	
	<hr/>	\$335 00

PERMANENT FUND.

CR.

By fees of 95 life members to December 31, 1888.....	\$950 00	
5 " " " 1889.....	50 00	
	<u> </u>	\$1,000 00

DR.

To amount on deposit with Wiscasset Savings Bank..	\$440 72	
balance due the fund.....	559 28	
	<u> </u>	\$1,000 00

Maine State Pomological Society.

Report of the Seventeenth Annual Exhibition Held in Lewiston, September 10, 11, 12 and 13, 1889.

The Executive Committee perfected arrangements with the Trustees of the Maine State Agricultural Society for holding the Society's Seventeenth Annual Exhibition in connection with the annual exhibition of their Society. The entire third floor of the exhibition building was given to our Society under this arrangement. The most cordial and friendly relations existed between the officers of the two societies, and so far as we know there was perfect harmony of action. Under this arrangement the exhibition was held in the exhibition hall of the State Fair Park, Lewiston, September 10, 11, 12 and 13, 1889.

The exhibition as a whole was one of the best the Society has ever held. The entire space was well filled, and the display of fruit and flowers was well arranged. It was the purpose of the officers to devote themselves during the fair to the interests of exhibitors and fruit growers. The committee work was done quietly but in a satisfactory manner. The premiums awarded were paid several weeks earlier than heretofore. There were simple decorations of the hall which added much to its appearance. Above the exhibition of fruit at the end of one wing was a large floral design, consisting of an eagle with outspread wings made of golden-rod; the eagle was standing upon a huge shield of alternate bars of golden-rod and evergreen. The design rested on an evergreen platform, and at its base opportunity was given the visitors to ballot for choice of a national flower. There was a very large majority in favor of the golden-rod.

Although the fruit shown was well matured and of large size, there were fewer specimens of perfect fruit than usual. The fruit showed the presence of insects, especially the codling worm and the apple maggot.

The popularity of the special five dollar premiums in 1888 induced the executive committee to still further extend the same feature, and accordingly the Gravenstein apple, Clapp's Favorite and Bartlett pears were added. The exhibition of apples for this premium was very large, occupying a table across the end of the east wing of the hall fifty feet in length. The competition of pears for this premium was less satisfactory, although there were several fine plates.

The premiums on wild flowers were extended by adding pressed specimens to the list. In both the cut and pressed flowers there were two conditions, the number must be not less than twenty, and the specimens must bear the correct botanical and popular names. There was a good display and it proved one of the most instructive features of the exhibition.

It was a pleasure to have an exhibition from Aroostook. Though it was not a large one, it was grown farther north than any ever shown at our fairs. There were several counties conspicuous by their absence. It would add much to the interest of our exhibitions if all parts of the State could be represented. In no other way can the Society so well learn the wants of the State in fruit matters, and furthermore it would aid its officers in laying out the future work of the Society.

Of flowers there was a very large general exhibition, and two green-house displays made by John Burr and W. G. Bailey, both of Freeport. Their collections were good and formed an attractive feature in the hall.

The General Rules of the exhibition were essentially the same as for the last four years. As they were published in full in the Premium List and have reference only to the affairs of the exhibition they are omitted in the present volume.

List of Premiums Awarded at the Seventeenth Annual Exhibition, 1889.

APPLES—General Collections.

AWARDS. Best exhibition of fruit grown by exhibitor: D. P. True, Leeds Center, \$5.00; J. S. Hoxie, North Fairfield, \$3.00.

Best general exhibition of apples grown by exhibitor in any part of the State: S. H. Dawes, Harrison, \$12.00; H. G. Fairbanks, Winthrop, \$8 00; E. F. Purington, West Farmington, \$5.00.

COUNTY EXHIBITIONS.

Best general exhibition of apples grown by the exhibitor in Androscoggin county: A. S. Ricker, Turner, \$8 00; N. W. Harris, Auburn, \$6.00; I. T. Waterman & Sons, East Auburn, \$4.00.

For the same in Aroostook county: E. Tarr, Castle Hill, gratuity, \$5.00.

For the same in Cumberland county: J. W. True, New Gloucester, \$8.00; S. R. Sweetser, Cumberland Center, \$6.00.

For same in Franklin county: G. K. Staples, Temple, \$8.00; M. C. Hobbs, West Farmington, \$6.00; D. C. Averill, Temple, \$4.00.

For same in Kennebec county: E. A. Lapham, Pittston, \$8 00; W. R. Wharff, Gardiner, \$6 00; C. I. Perley, Seward, \$4.00.

For same in Knox county: Alonzo Butler, Union, \$8.00; Elmas Hoffses, Warren, \$6.00.

For same in Lincoln county: E. W. Dunbar, Damariscotta, \$8.00.

For same in Oxford county: C. H. George, South Paris, \$8.00; Lemuel Gurney, Hebron, \$6.00; S. M. King, South Paris, \$4.00.

For same in Penobscot county: E. H. Kenniston, Arnold, \$8.00. F. C. Chase, South Etna, \$6 00; C. A. Arnold, Arnold, \$4.00.

For same in Sagadahoc county: H. S. Cary, Topsham, \$8.00; Fred Wright, Bath, \$6 00; A. P. Ring, Richmond, \$4.00.

For the same in Somerset county: J. S. Hoxie, North Fairfield, \$8.00; F. E. Nowell, Fairfield, \$6.00.

For the same in Waldo county: M. E. Bartlett, East Dixmont, \$8.00; B. W. Bartlett, East Dixmont, \$6.00.

For the best collection of crab apples: J. S. Hoxie, North Fairfield, \$1.00; E. H. Kenniston, Arnold, 50c.

SPECIAL PREMIUMS—BALDWINS, R. I. GREENINGS, ROXBURY RUSSETS,
GRAVENSTEINS.

For best dish of Baldwins, Rhode Island Greenings, Roxbury Russets and Gravensteins, consisting of twelve specimens each.

Baldwins: E. H. Kenniston, Arnold, \$5.00; S. H. Dawes, Harrison, \$3.00; H. S. Cary, Topsham, \$2.00.

Rhode Island Greenings: E. H. Kenniston, Arnold, \$5.00; W. E. Rose, Greene Corner, \$3 00; H. G. Fairbanks, Winthrop, \$2.00.

Roxbury Russet: Alonzo Butler, Union, \$5.00; A. P. Ring, Richmond, \$3.00; C. H. George, South Paris, \$2.00.

Gravenstein: J. Pope & Son, Manchester, \$5.00; N. W. Harris, Auburn, \$3.00; A. C. Day, Turner, \$2.00.

SINGLE VARIETIES.

Alexander: John E. Haley, \$1.00; O. S. Judkins, 50c.

American Golden Russet: I. T. Waterman & Sons, \$1.00; A. J. Osgood, 50c.

Ben Davis: C. A. Arnold, \$1.00; I. T. Waterman & Sons, 50c.

Benoni: J. S. Hoxie, \$1.00; H. W. Brown, 50c.

Black Oxford: D. W. Pulsifer, \$1.00; George A. Pike, 50c.

Deane: E. F. Purington, \$1.00; S. L. Farwell, 50c.

Duchess of Oldenburg: John E. Haley, \$1.00; J. Pope & Son, 50c.

Early Harvest: Elmas Hoffses, \$1.00.

Fall Harvey: M. C. Hobbs, \$1.00; E. G. Blake, 50c.

Fameuse: D. H. Knowlton, \$1.00; C. A. Arnold, 50c.

Garden Royal: C. I. Perley, \$1 00; A. N. Goodrich, 50c.

Grimes Golden: F. A. Rogers, \$1.00; M. P. Hawkins, 50c.

Hubbardston Nonsuch: W. R. Wharff, \$1.00; T. M. Lombard, 50c.

Hunt Russet: E. Hoffses, \$1.00; C. A. Arnold, 50c.

Jewett's Fine Red: S. H. Dawes, \$1.00; J. H. Merrow, 50c.
 King of Tompkins County: S. R. Sweetser, \$1.00; E. H. Kenniston, 50c.

King Sweeting: E. F. Purington, \$1.00; F. E. Nowell, 50c.

Large Yellow Bough: A. N. Goodrich, \$1.00; E. F. Purington, 50c.

McIntosh Red: H. G. Fairbanks, \$1.00; M. C. Hobbs, 50c.

Milding: C. I. Perley, \$1.00; H. Johnson, 50c.

Mother: A. J. Osgood, \$1.00; J. Pope & Son, 50c.

Munson Sweet: D. H. Knowlton, \$1.00; Dan Carey, 50c.

Northern Spy: F. A. Rogers, \$1.00; Lemuel Gurney, 50c.

Orange Sweet: J. S. Hoxie, \$1.00; F. E. Nowell, 50c.

Peck's Pleasant: A. J. Osgood, \$1.00; C. H. George, 50c.

Pomme Royal: C. H. George, \$1.00; J. Pope & Son, 50c.

Porter: E. H. Kenniston, \$1.00; John Dunton, 50c.

Pound Sweet: S. L. Farwell, \$1.00; J. W. True, 50c.

President: I. T. Waterman & Sons, \$1.00; W. W. Mower, 50c.

Primate: C. I. Perley, \$1.00; E. F. Purington, 50c.

Pumpkin Sweet: A. J. Pratt, \$1.00; Miss L. Skillings, 50c.

Red Astrachan: E. Hoffses, \$1.00; J. S. Hoxie, 50c.

Red Canada: W. O. Towle, \$1.00; H. G. Fairbanks, 50c.

Rolfe: S. R. Sweetser, \$1.00.

Russell: D. C. Averill, \$1.00; E. F. Purington, 50c.

Stark: L. H. Blossom, \$1.00; A. H. Bickford, 50c.

Somerset: H. W. Brown, \$1.00; F. E. Nowell, 50c.

Starkey: J. Pope & Son, \$1.00; F. E. Nowell, 50c.

Talman's Sweet: H. T. & S. E. Leech, \$1.00; F. H. L. Sleeper, 50c.

Tetofsky: E. W. Dunbar, \$1.00.

Wagener: N. W. Harris, \$1.00; H. Johnson, 50c.

Wealthy: T. M. Lombard, \$1.00; S. R. Sweetser, 50c.

Williams' Favorite: H. S. Cary, \$1.00; W. W. Rodbird, 50c.

Winthrop Greening: F. E. Nowell, \$1.00; W. W. Mower, 50c.

Yellow Bellflower: R. H. Gardiner, \$1.00; C. I. Perley, 50c.

Yellow Transparent: S. R. Sweetser, \$1.00.

Dudley: J. W. Dudley, gratuity \$1.00.

Gideon: P. P. Burleigh, gratuity \$1.00.

PEARS—General Exhibitions.

S. H. Dawes, Harrison, \$10 00 ; S. Rolfe, Portland, \$8.00 ; D. J. Briggs, South Turner, \$5.00.

SINGLE VARIETIES.

Clapp's Favorite : L. J. Perkins, \$5.00 ; Rufus Prince, \$3.00.
 Bartlett : S. H. Dawes, \$5.00 ; H. T. & S. E. Leech, \$3.00.
 Belle Lucrative : A. Butler, \$1.00 ; J. S. Hoxie, 50c.
 Beurre d'Anjou : S. H. Dawes, \$1.00 ; H. & H. Whitman, 50c.
 Beurre Hardy : R. H. Gardiner, \$1.00.
 Beurre Superfin : D. P. True, \$1.00 ; I. W. Emerson, 50c.
 Beurre Diel : I. W. Emerson, \$1.00.
 Buffum : D. P. True, \$1.00 ; C. I. Perley, 50c.
 Doyenne Boussock : C. I. Perley, \$1.00.
 Duchesse d'Angouleme : S. H. Dawes, \$1.00 ; G. C. Chase, 50c.
 Eastern Belle : J. S. Hoxie, \$1.00.
 Flemish Beauty : J. H. Merrow, \$1.00 ; Mrs. E. A. Ellis, 50c.
 Goodale : C. I. Perley, \$1.00 ; J. W. True, 50c.
 Howell : J. S. Hoxie, \$1.00 ; I. W. Emerson, 50c.
 Lawrence : S. H. Dawes, \$1.00 ; John Dunton, 50c.
 Louise Bonne de Jersey : S. H. Dawes, \$1.00 ; D. P. True, 50c.
 Nickerson : G. A. Pike, \$1.00.
 Seckel : G. C. Chase, \$1.00 ; D. J. Briggs, 50c.
 Sheldon : S. H. Dawes, \$1.00 ; I. W. Emerson, 50c.
 Swan's Orange : J. S. Hoxie, \$1.00 ; C. I. Perley, 50c.
 Souvenir du Congres : S. Rolfe, \$1.00 ; E. H. Kenniston, 50c.

Class III—GRAPES.

For best exhibition of open air grapes : J. S. Hoxie, \$3.00.
 Hartford Prolific : C. H. George, \$1.00.
 Blood's Seedling : L. Gurney, \$1.00.
 Concord : H. Johnson, \$1.00.
 Moore's Early : L. Gurney, \$1.00.
 Janesville : L. Gurney, \$1.00.

PLUMS—Single Varieties.

Golden Drop : C. H. George, \$1.00 ; G. C. Chase, 50c.
 Green Gage : E. W. Dunbar, \$1.00.
 Prince's Imperial Gage : E. W. Dunbar, \$1.00.

Purple Gage: E. W. Dunbar, \$1.00.

General Hand: L. Gurney, \$1.00.

Lawrence: E. F. Purington, \$1.00.

Lombard: T. M. Lombard, \$1.00; G. C. Chase, 50c.

Smith's Orleans: E. W. Dunbar, \$1.00.

River's Blue Prolific: E. W. Dunbar, \$1.00.

Niagara: E. W. Dunbar, \$1.00; Miss L. Skillings, 50c.

MISCELLANEOUS ARTICLES—Canned Fruit, Preserves, &c.

For best dish of peaches: W. O. Towle, \$2.00; S. H. Dawes, \$1.00.

Quinces: G. C. Chase, \$2.00.

For best peck of cultivated cranberries: A. C. Greenleaf, \$2.00; H. Johnson, \$1.00.

For best variety of canned fruits, preserves, pickles, etc., made and put up by the exhibitor: Mrs. W. H. Waterman, \$8.00; Mrs. Benson Grant, \$5.00; Mrs. Elbert Waterman, \$3.00.

Canned peaches: Mrs. E. Waterman, 50c.; Mrs. Francis Hoyt, 25c.

Canned plums: Mrs. Francis Hoyt, 50c.; Miss Myrtie V. Averill, 25c.

Canned strawberries: Mrs. F. Hoyt, 50c.; Miss M. V. Averill, 25c.

Canned raspberries: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Canned blackberries: Miss M. V. Averill, 50c.; Mrs. E. F. Purington, 25c.

Canned gooseberries: Mrs. E. F. Purington, 50c.; Mrs. F. Hoyt, 25c.

Canned blueberries: Mrs. W. H. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Canned cherries: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Canned quinces: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Canned tomatoes: Mrs. W. H. Waterman, 50c.; Mrs. E. Waterman, 25c.

Preserved quinces: Mrs. W. H. Waterman, 50c.

Preserved apples: Miss M. V. Averill, 50c.; Mrs. F. Hoyt, 25c.
Preserved plums: Mrs. F. Hoyt, 50c.; Miss M. V. Averill, 25c.
Preserved pears: Mrs. F. Hoyt, 50c.; Miss M. V. Averill, 25c.
Preserved strawberries: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Preserved raspberries: Mrs. W. H. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Preserved currants: Mrs. E. F. Purington, 50c.; Mrs. F. Hoyt, 25c.

Preserved cherries: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Assorted pickles: E. A. Lapham, 50c.; Mrs. F. Hoyt, 25c.

Tomato catsup: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Best collection of apple jellies: Mrs. W. H. Waterman, \$2.00; Mrs. D. H. Colby, \$1.00.

Best jar quince jelly: Mrs. W. H. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Apple jelly: Mrs. W. H. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Grape jelly: Mrs. F. Hoyt, 50c.; Mrs. W. H. Waterman, 25c.

Currant jelly: Mrs. E. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Strawberry jelly: Mrs. W. H. Waterman, 50c.; Mrs. F. Hoyt, 25c.

Raspberry jelly: Mrs. F. Hoyt, 50c.; Mrs. E. Waterman, 25c.

Rhubarb jelly: Miss Nellie True, 50c.; Mrs. F. Hoyt, 25c.

Maple syrup: Miss M. V. Averill, 50c.; W. L. Racliffe, 25c.

Apple barrels: Gorden Brothers, New Sharon, gratuity, \$2.00.

CUT FLOWERS.

Best display: Mrs. Chas. Stanley, \$10.00; Miss Lucy A. Chandler, \$8.00; Mrs. H. W. Fuller, \$5.00; Miss Cora E. Ring, \$3.00.

Best exhibition of roses: John Burr, \$5.00.

Dahlias: Mrs. Chas. Stanley, \$2.00; Miss Nellie A. Day, \$1.00.

Chinese Pinks: Mrs. Chas. Stanley, \$1.00; Mrs. Mary Griffin, 50c.

Asters: Master Ned Pope, \$1.00; Mrs. Chas. Stanley, 50c.

Pansies: Mrs. H. W. Fuller, \$1.00; Mrs. Chas. Stanley, 50c.

Zinnias: Mrs. Chas. Stanley, \$1.00; Mrs. F. Hoyt, 50c.

Phlox Drummondii: Mrs. Chas. Stanley, \$1.00; Mrs. W. H. Waterman, 50c.

- Stocks: Mrs. Chas. Stanley, \$1 00.
- Balsams: Mrs. W. H. Waterman, \$1.00; Mrs. E. Waterman, 50c.
- Petunias: Mrs. Chas. Stanley, \$1.00; Mrs. Mary Griffin, 50c.
- Gladioli: Miss Lucy A. Chandler, \$2.00; Mrs. Chas. Stanley, \$1.00.
- Verbenas: Mrs. F. Hoyt, \$2.00; Mrs. Chas. Stanley, \$1.00.
- Best parlor bouquet (amateurs): Miss Cora H. Stanley, \$1.00; Mrs. F. Hoyt, 50c.
- Wall bouquet (professional) \$2.00.
- Wall bouquet (amateur): Mrs. D. H. Knowlton, \$1.00; Miss Cora H. Stanley, 50c.
- Hand bouquet (professional): John Burr, \$2.00.
- Hand bouquet (amateur): Lucy A. Chandler, \$1.00; Mrs. F. Hoyt, 50c.
- Floral design (professional): John Burr, \$8 00.
- Floral design (amateur): Mrs. H. W. Fuller, \$5.00; Lucy A. Chandler, \$3.00.
- Floral wreath: John Burr, \$2.00; Mrs. F. Hoyt, \$1.00.
- Dinner table decoration: Miss L. M. Pope, \$2.00.
- Basket cut flowers: Miss Cora H. Stanley, \$2.00.
- Dried grasses: Mrs. W. S. Haskell, \$2.00; Mrs. Chas. Stanley, \$1.00.
- Everlasting flowers: Mrs. H. G. Fairbanks, \$1.00; Mrs. W. S. Haskell, 50c.

GREENHOUSE AND POT PLANTS.

- For best exhibition of greenhouse plants: John Burr, \$15.00; W. G. Bailey, \$10.00.
- Best exhibition pot plants: Miss L. M. Pope, \$10 00; Mrs. Charles Stanley, \$8.00.
- Ferns: John Burr, \$3.00.
- Geraniums: John Burr, \$2.00.
- Begonias: John Burr, \$2 00; W. G. Bailey, \$1.00.
- Coleus: Miss L. M. Pope, \$2.00; John Burr, \$1.00.
- Double Geranium: John Burr, 50c.
- Single Geranium: John Burr, 50c.
- Salvia Splendens: John Burr, 50c.
- Foliage Begonia: Miss L. M. Pope, 50c.; W. G. Bailey, 25c.

Flowering Begonia: W. G. Bailey, 50c.; John Burr, 25c.

Coleus: Miss L. M. Pope, 50c.; John Burr, 25c.

Carnations: John Burr, 50c.

Single pot plant: John Burr, \$1.00; Miss L. M. Pope, 50c.

Rustic stand: Miss L. M. Pope, \$2.00.

SPECIAL PREMIUMS.

For best floral design by girl or boy under 15 years of age: Miss Lucy B. Burr, \$3.00.

Best exhibition cut wild flowers: Clarence H. Knowlton, \$2.00; Mrs. C. E. Waterman, \$1.00.

Best exhibition pressed wild flowers: Clarence H. Knowlton, \$3.00; Laura B. Beals, \$2.00; Geo. M. Chase, \$1.00.

Business Transactions.

April 11, 1889. Meeting of the Executive Committee held in Lewiston.

The President announced that our Society had been invited by the Trustees of the State College to elect a member of the Council of the Agricultural Experiment Station, and that in conformity with the invitation he had appointed D. H. Knowlton as the representative of the Pomological Society for one year. The appointment was confirmed.

The Committee were invited to meet with the Trustees of the Maine State Agricultural Society who were then in session, and arrange terms, &c., for the next annual fair. At this conference it was mutually agreed between the Trustees of the State Agricultural Society and the Executive Committee of the Maine State Pomological Society, that our annual exhibition be held with them September 10th, 11th, 12th and 13th. The terms agreed upon were the same as last year—our Society to receive from them the sum of five hundred dollars. At this meeting the Committee revised the Premium List, and the following assignments were made:

Collective exhibitions, general and county, L. H. Blossom.

Single varieties of apples, etc., Henry W. Brown.

Grapes, pears, plums and miscellaneous articles. J. W. True.

Flowers, plants, etc., Chas. S. Pope.

Voted, To hold a public meeting second evening of the fair.

August 5th. The Executive Committee met at the Revere House, Auburn, where the Trustees of the State Agricultural Society were in session.

Arrangements were made for the annual exhibition. The Trustees agreed to give our Society the entire third floor for the pomological display.

The Secretary was instructed to employ a speaker for the evening meeting during the fair.

September 5th. Messrs. Pope, True and Blossom met at the fair grounds and arranged for such alterations as were deemed desirable.

September 10th, 11th, 12th and 13th. Annual exhibition.

September 11th. Annual meeting.

Voted, To postpone the election of officers to the time and place of holding the next winter meeting of the Society.

PUBLIC MEETING.

Report of Committee on New Fruits was made by the Secretary, who exhibited samples of the "Gideon" apple grown by Hon. Parker P. Burleigh of Linneus, and of "Dudley's Winter," grown by the originator in Aroostook county.

For papers and other matters connected with the public meeting reference is made to that portion of the transactions containing papers, etc.

At a meeting of the Executive Committee held during the fair it was

Voted, To consider the feasibility of making an exhibition of Maine fruit at the Bay State Agricultural Show and Fair in October next.

Later this exhibit was placed in charge of Henry W. Brown of the Executive Committee whose report appears in another part of this volume.

October 18, 1889. Meeting of Executive Committee in Lewiston.

Voted, That we unite with the Board of Agriculture in holding a joint winter meeting, and that the time and place be referred to Secretary Gilbert of the Board of Agriculture, President Pope and the Secretary, Knowlton.

The premium account, amounting to \$616, was audited, and the Treasurer was authorized and instructed to pay the same. The Treasurer was also authorized to make a temporary loan not exceeding \$250.

A letter was read from Mr. H. W. Brown, in whose charge was placed the Bay State exhibition of this Society, in which he announced that he had received premiums to the amount of \$57.

Voted, That the Treasurer be instructed to deposit fifty dollars in the Wiscasset Savings Bank to the credit of the permanent fund.

February 4, 1890. Meeting of Executive Committee held in Norway. Letters were read from George B. Sawyer, Esq., former Secretary of this Society, in which he stated that he had packed the books, pamphlets and catalogues, in his possession, belonging to

the Society. The bound volumes from other bodies were sent to library of the State College at Orono; the unbound sheets of several years' transactions were sent to Smith & Reid of Augusta, bookbinders, and reports of our own Society, papers, etc., were sent to our present Secretary.

Audited unpaid accounts for the current year.

February 4th. Business meeting of the Society, held in Patrons' Hall, Norway, President Pope presiding.

The officers of the Society made their annual reports. [See report of annual exhibition, Treasurer's report, etc.] Officers were elected for the current year. [See List of "Officers for 1890."]

A letter was read from Secretary Donlop of the Montreal Horticultural Society, inviting our Society to send delegates to the Dominion Convention of Fruit Growers to be held in Ottawa, February 19th, 20th and 21st, 1890.

Voted, To place the letter on file and extend greetings of our Society, etc.

The papers read during the sessions of the winter meeting and the discussions on the same appear in other parts of these "Transactions" under their respective subjects.

Phineas Whittier, A. S. Ricker and J. W. True were appointed a committee to examine the fruit on exhibition and report on the same.

The Committee on New Fruits reported informally.

The Committee on Revision of Society's Fruit Catalogue reported. The chairman stated that as a result of their labors a list had been prepared and was published in the last volume of the Society's Transactions.

Voted, To continue the committee another year.

J. W. True, Prof. F. L. Harvey and Phineas Whittier were appointed a Committee on Resolutions.

Through the kindness of Prof. F. L. Harvey of the State College spraying apparatus from several manufacturers was placed on exhibition during the meetings and explained by him. [See resolutions.]

The Secretary presented samples of the Newtown Pippin, kindly furnished by Mr. Charles M. Griffing, and it was

Voted, That the thanks of this Society be and hereby are extended to Mr. Charles M. Griffing of Shelter Island, Long Island, N. Y., for his courtesy in forwarding to us specimens of the Newtown Pippin,

and that the Secretary be instructed to forward to him a copy of this vote.

The Committee on "Maine Fruit Growers' Association" appointed at the State Fair meeting reported: The report was accepted and the Committee continued another year. [See report of Committee published in full.]

Mr. Phineas Whittier in behalf of Committee to examine fruits reported as follows:

First. That there are on exhibition some over one hundred plates of choice fruit.

Second. There are ten collective exhibitions, the largest of which consists of thirteen varieties.

Third. The first premium of \$5 is awarded to G. K. Staples, Temple, and the second of \$3 to H. W. Brown, Newburg.

The Secretary stated that for the years 1879-80-81 no transactions were published, and the publication of the same was referred to Secretaries Gilbert and Knowlton. The copy for the same is in the hands of the Secretary, having been prepared by Geo. B. Sawyer, Esq., while Secretary of the Society.

The Committee on Resolutions presented the following, which passed unanimously:

Resolved, That the thanks of the Maine State Pomological Society and the State Board of Agriculture be and hereby are extended to the Maine Central, Grand Trunk, and Knox & Lincoln Railroads for reduced rates of fare over their respective roads; to the proprietor of the Beals' Hotel for reduced rates of entertainment; to the local and general press for notices that have been given to the public from time to time; to the Norway Grange and its members for the grand and cordial reception extended to this meeting; to the fine choir that has furnished music for our gatherings; to the citizens of Oxford county for the cordial reception and bountiful entertainment furnished all visitors; to all those persons who have presented papers and reports.

Resolved, That the Maine State Pomological Society tender its thanks to Rumsay & Co., Seneca Falls, N. Y.; The Nixon Nozzle & Machine Co., Dayton, O.; P. C. Lewis, Catskill, N. Y., and Thos. Summerville & Sons, Washington, D. C., for placing on exhibition, free of cost to the Society, spraying apparatus manufactured by them.

Resolved, That the Secretary of the Society be authorized to mail each of the firms above named a copy of this resolution.

Resolved, That the thanks of the meeting be tendered to Mr. H. G. Cole of Boston for the use of Central Hall for our Wednesday evening meeting.

Remarks were made by several citizens, who in behalf of the citizens of Oxford county and Norway Grange tendered a hearty vote of thanks to the Maine State Pomological Society and the State Board of Agriculture for the excellent programme and the valuable fruit knowledge they have furnished during these meetings.

PAPERS, DISCUSSIONS, REPORTS. ETC.,

PRESENTED AT THE

UNION WINTER MEETING

OF THE

Maine State Pomological Society & State Board of Agriculture,

HELD IN

GRANGE HALL, NORWAY,

February 4, 5 and 6, 1890.

“Fruit culture, therefore, whether considered as a branch of profitable industry, or as exercising a most beneficial influence upon the health, habits and tastes of the people, becomes a great national interest, and whatever may assist in making it better understood, and more interesting, and better adapted to the various wants, tastes, and circumstances of the community, cannot fail to subserve the public good.”

The Union Winter Meeting.

INTRODUCTORY.

The union meetings held at New Gloucester and Damariscotta were so popular, and the general programmes were so strong, the executive officers were unanimously in favor of uniting again with the Board of Agriculture. A union meeting of the two organizations possesses the strong points of each, and by the arrangements several speakers outside of the State are secured to present features of our agricultural industries, that otherwise would receive little attention. Arrangements were accordingly made with Secretary Gilbert, and the programme presented was one of the best ever offered to the public. It is a pleasure to note in connection with it, that every paper announced was read by its author.

Previously invitations had been received by the Society to hold a winter meeting in Oxford county, but for reasons that seemed satisfactory it was deemed expedient to have the meetings in other parts of the State. This year the invitations were renewed informally by citizens of Oxford county during the State Fair, and later the following cordial invitation was received from Norway Grange, through the courtesy of Worthy Master Tracy :

NORWAY, Nov. 3rd, 1889.

D. H. KNOWLTON, Secretary,

Dear Sir:—Our Grange voted to extend an invitation to the Maine State Pomological Society to hold a meeting at our hall as soon as convenient, also to State Board of Agriculture to hold an institute at the same time.

In accordance with this vote we should be pleased to have you meet with us, and will do what we can to have a pleasant and profitable meeting. Our grange voted to give you the use of the hall, warm and light it. Hall is quite large and provided with an organ. Beals' Hotel will accommodate all of you for \$1.25 per day. Rooms are warmed by steam, and it is a first-class house. Our members will accommodate what they can free. Please let me know as soon as you can, if you decide to come when the meeting will be. Also

if you would like our choir to furnish music, and just what we can do to be of interest to the meeting, and we will do what we can. Of course you want a display of fruit. Next week I shall be at State Grange, but will be ready to carry out any suggestions as soon as I get home.

Yours fraternally.

W. H. TRACY, *Master*.

In accordance with the invitation arrangements were perfected, and the meeting was held in Patrons' Hall, Norway, February 4, 5 and 6, 1890. The papers presented were excellent, the discussions, though brief, were practical, and the attendance was large and enthusiastic from first to last. Comparing the papers with those read before other societies we do not hesitate to say the literary exercises of our union meeting take high rank among them.

The exhibition of fruit was good and represented orchard ng in six counties of the State, namely: Androscoggin, Cumberland, Franklin, Kennebec, Oxford and Penobscot. The fruit was of excellent quality, though many growers having disposed of their apples in the fall neglected to save the best specimens for exhibition. It may be well to note as an interesting fact, that the display receiving the first premium was grown at the foot of Mt. Blue, farther north than profitable fruit culture was supposed to be possible a few years since.

The officers of the Society are indebted to Mr. W. H. Tracy, Master of Norway Grange, and Mr. C. H. George for their cordial assistance in perfecting the details for the meeting. And to the members of the Grange the officers also desire to express their thanks for their co-operation in all matters relating to the meetings.

The ideas advanced in the following papers represent the opinions of individuals interested in Maine fruit culture. The Society presents them to the public as they were offered, but assumes no responsibility for the same.

OPENING EXERCISES.

At the hour appointed Mr. B. W. McKeen of Fryeburg, member of the Board of Agriculture from Oxford county, called the meeting to order. He briefly referred to the objects of the gathering and thanked the officers of the State Pomological Society for the promised feast of good things in pomology. The grange choir being in their places all were invited to join with them in singing "America." The speaker then introduced Rev. Miss Caroline E. Angell of Norway, who gave the Address of Welcome.

ADDRESS OF WELCOME.

By Rev. Miss CAROLINE E. ANGELL, Norway.

Mr. President and Friends: I have read of a little child whose mother having left her in care of the nurse, on returning, said, "Well, Bessie, have you been a good girl?" "No!" "Not been good? Have you been bad?" "No!" "Not bad? How *have* you been?" "I've been drest comforable?"

Now, however, not good nor bad my remarks may be, I'm not at all "comforable" in making them, though I eagerly extend greeting to you, but let me come at our welcome, by some allusions to associations in general, their attitudes and their changes. You cannot take up a paper in these days, but there will be accounts of some notable gatherings, so important and influential that the prominent journals will have sent a reporter to take down the proceedings and point out the indications of these meetings. Merchants' clubs, market-men's conventions, commercial travelers' reunions, agricultural assemblies, pomological societies, patrons of husbandry, not a department in the whole world of industry but has its society, its league, to declare not alone for self-protection, a condition made really necessary by the very close relationship all departments bear, but to tell of the interest the people have in their own lives, and of their willingness, their eagerness to learn what better methods can be devised for carrying forward their own branches, *not* as making one calling to over-ride another, but to render each and all efficient, and productive and progressive.

It used to seem that the few organizations I knew about in my youth were in a sense selfish societies. The members belonging got together with an air that implied, "we are probably of the most capable people there are, and we are going to see what measures we can take to improve *ourselves*." There was not much thought about distributing their helpfulness. Somehow they went apart, and kept apart in a selfishness of way that laid them open to disapproval, and well nigh dislike. There was more conceit to the party in belonging than there was *outside* appreciation of him or his society. They stood selfishly and without much benevolent growth. But in these later days, there seems to be something much more fraternal in their thoughts and managements, something more

helpful in their general attitude. Take for instance the Young Men's Christian Association. I easily recall when this body forgot almost the "Christian" feature in its organization; when it was carrying itself with an aristocratic air; when it was composed of members who had some means, some business, some education; who would come together in quarters that were quite luxurious and be shut entirely away from the grades needing the companionship of such intelligence and influence as this association could have furnished. Now though they are quite as strict in their by-law feature, they are very much more generous in their organizational purpose; for reading-rooms, libraries, social games are furnished, to which any one can obtain access; and that they have multiplied until not a single small city—as well as large—together with "grown-up" villages, all having such an institution, testifies how, as they have opened up from their secret and more personal attitudes, they have been prospered quite beyond any possibility under the former spirit.

However, such organizations have not yet grown unselfish enough to admit women among their members. Almost I've thought it was going to be left for the church and for the Patrons of Husbandry to take heed of, and have the power of this mighty element by giving it equally honorable and mutual membership. When I've seen the people going to "Grange," driving into town no matter what the weather, what the travelling, with its never being too cold for convening nor too hot for gathering, I've said comfortably to myself, "This is due 'awfully' to the fact that *women* belong and have equal chances at offices or service." Take a matter in which a whole family can be actively interested and it would challenge worse weather than we have here in Maine to keep them away from the place of meeting.

A man will let any number of Masonic or Odd Fellows sessions go by without attending, because he must go alone; at least apart from his family. But where the father and mother with all the household—even the babe can attend, *that* meeting will be looked after, and the team be gotten up with great willingness.

We have army posts; but before they could really flourish they had to be supplemented by relief corps; and if now both organizations could be amended to admit both sexes as members, they would thrive notably, and the Grange have a quality of not rival but parallel order, showing of the same good times, and the same mutual,

universal interests. How we like this democracy within the Grange! How I like it! Because while I've not a single qualification for the institution, I'm yet admitted, perhaps because "angels and ministers of grace" are supposed to be harmless, if they are not helpful.

But we are here as an agricultural gathering, and I want to say a few words upon this great industry, that is really the fibre and sinew of the world; for how would any business or vocation flourish but for the support that comes from this particular department? All classes of occupation do reverence to *this*!

Somewhere I've read of commerce, that branch which is so luxurious in many of its methods, I've read that she is "the younger sister of agriculture," because she must look to this for all the strength that carries on her enterprises.

Trade increases the wealth and glory of a people, but the stamina of a country comes from the soil, which the agriculturist renders fruitful. Not long ago I read of a speaker before a Grange who said "This department, with its potato gospel!" and I thought why isn't the potato scriptural! It can feed, and it *does* feed hungry multitudes and that without any of that controversy accompanying so much of the testament gospel. Let us be glad that somebody outside ascribes a sufficient value to any of our productions as to call this rude groundling an evangelist.

Nor do we forget that the feature of fruit growing is the *special* reason of our being in session at this time. If that same man, with his vegetable text, was to stand before this display of fruit he would wonder if it did not all grow in the Garden of Eden! And yet, he would find none that could work the ruin of that mystic apple for these are every one healthful, with no attributes of good *and* evil but *all* superlatively "good." How much the fruits have become the chief food of many classes engaged in sedentary life in business, under cover; and how many of the people look to fine fruits as their luxuries. They all come from the soil, and the soil is "the mother of the world," nourishing from herself not only all occupations by feeding the people so engaged, but she cherishes every grade of sentient life. Agriculture is the basic industry, the foundation department of the whole world's thrift, with the farmer as lord and king of all enterprise.

Daniel Webster called the farmers "the founders of civilization," giving for his opinion that who could make two ears of corn or two

blades of grass grow upon a spot where only one could grow before would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.

And this order of occupation is the one in behalf of which we are met. We, you are constantly gathering in your respective home places, and assembling primarily for the improvement of your calling; but here, in a session more elaborate than usual, more far-reaching for the State, have sent up delegates and representatives. We are gathered here in a large convention that by comparison, by suggestion, by discussion we may come at methods beneficial to our special branches, and advantageous to ourselves individually. For, beside desiring to be better grangers, better fruit growers, better agriculturists of every kind, we want to become larger souled men and women too, which we can by associations like this, and I should be disloyal to my own calling if I did not sum up *all* of our wishing, and express it in that term, though it, too, belongs to my vocation, but which belongs to all departments, the term Christian! Children of that God who by driving his frost as a plough through the soil of the whole world has constituted *Himself* as a patron of agriculture.

And to this conference we bid you welcome. We welcome you to our town, to our hospitality, to our homes, to our sessions. Our hearts are warmed, and our hands extended in glad greeting, and we trust that to you, no less than to ourselves, this will be a red-letter time in the history of these several societies.

In behalf of the visiting organizations Secretary Gilbert was invited to respond to the Address of Welcome.

RESPONSE.

By Z. A. GILBERT, Secretary of the Board of Agriculture.

It seems to devolve upon me in behalf of the organizations here represented, to give a response to the words of welcome to which we have listened with so much pleasure.

If the position of the distinguished speaker who has pronounced these words was embarrassing, what in comparison must be my own situation in attempting to promptly frame a fitting response?

It gives us great pleasure to be thus welcomed to your presence and to this hall. Such a welcome tends to give us encouragement and lightens our labors.

In the tendency of the different branches of business in our land to protect their own interests by organized effort, we often feel that the importance of that which relates to the soil is too often overlooked.

We are not a "potato society" though if we occupied that place we might well feel proud of the position, for there is hardly a well-ordered table in the land which does not have the potato in its cuisine three times a day, seven days in the week, and fifty-two weeks in the year. Is it a degrading employment then to raise potatoes and supply this unanimous want? This Society, then, would be doing a grand work in encouraging its production and improving the methods and practices connected therewith. People are often wishing that the peach orchards of Delaware and New Jersey and the orange groves of Florida could be transferred to our own State, forgetting that the potatoes of Aroostook are far more profitable than these fruits.

This organization is devoted, first of all, to the promotion of fruit growing here in our own State. Seventeen years ago the Society was organized and started in its work, and every year from that time to this it has held these annual winter meetings. The business of fruit production at the time of the organization of the Society was quite limited compared with the present time. The idea was advanced by the Society in its early years that should we multiply the quantity of fruit produced by the thousand, we should have a better market than we were then having. Results have proved the soundness of that statement. In place of a limited demand such as we then had we find European agents coming across the water in quest of our fruit for shipment abroad. This could not have been so if we had not succeeded in producing sufficient quantities to attract the attention of these buyers.

Our Society has been at work not for its own benefit, but for the benefit of the public, and it is a justice belonging to its faithful members to state that up to the present time none of its officers have ever received any compensation for the time spent in its service, save that recently a pittance of a salary has been paid to the Secretary. Year after year the exacting duties have been performed promptly and we trust efficiently, with no other motive than a desire to promote fruit growing in the State. It is proper that the people who have extended this warm welcome should understand these things and know that it is not for pay that we are working. True

some money is needed to carry on the work, and we ask all who are pleased to do so to lend their aid in this way to the extent of a membership. If this is not your pleasure we are still glad indeed to have you encourage by your presence and assure us of your interest by words of welcome.

Fruit growing in our State has a grand outlook. Only a year ago some faint-hearted fruit growers felt that the business had been overdone and that we should never again realize profitable returns. How quickly this idea has been dissipated, with our best apples selling now at four dollars per barrel!

We have heard much of the advantages of Southern California for fruit growing and many from among us have been led to flock there with their means for investment in the business. The luscious grapes of that region have sold this year at only fifteen dollars a ton and the price never goes above twenty. What inducement can there be to emigrate to that region when we can get two or three times as much per pound for Maine apples? Some of the land suitable for orange groves in California is held at \$3,000 per acre. In my own town are acres of land covered with beautiful apple trees that could have been bought for five dollars per acre before the trees were set. Fifteen years of time brings an orchard worth \$300 per acre, and in that fifteen years it will yield fruit enough to pay every cent of the outlay.

It is one purpose of a gathering like this to encourage confidence in the business and acquaint the public with what has been done, and what can be done in the future. If we are in any degree influential in carrying out this purpose certainly the Society should receive encouragement. While we believe it can justly claim that its influence has been in a measure effectual, still an increase of means to go with individual effort would enable us to accomplish much more. Our only source of receipts is from membership.

We are especially glad to meet the fruit growers of Oxford county and of this town of Norway, and to be assured of your interest in this work; and we heartily thank you for the words of welcome so happily pronounced.

Mr. Charles S. Pope, President of the Maine State Pomological Society, was then introduced and delivered his annual address.

ANNUAL ADDRESS.

By CHARLES S. POPE, President.

Ladies and Gentlemen, Members of the Pomological Society:

For seventeen consecutive years we have met the fruit growers of Maine at this, our annual meeting. Each year we welcome it with increasing pleasure, and should count it a great deprivation were we unable to attend. "Iron sharpeneth iron," and our intercourse here acts as a spur to awaken our best endeavors throughout the year. During these seventeen years we have found much profit and pleasure in meeting with the orchardists in various locations in the State, but this is our first meeting in the famed county of Oxford, noted alike for its intelligent culturists and charming natural scenery. The snows and frosts of winter must of necessity hide much of the natural attractions of your place, but it also gives the farmer liberty to devote more time to the discussion of the fruit question, and we hope to meet a goodly number of your orchardists here.

We were able to make a satisfactory arrangement with the officers of the State Agricultural Society, and again our fall exhibit of fruits and flowers was made in Lewiston. For the first time we were allowed to use the whole of the third floor of the exhibition building, and even those who had grave doubts about our needing so much space were well satisfied with the display. Wishing to improve the appearance of the hall, which in its unfinished condition, is not a good place for such an exhibition, we took pains to put up a little bunting; and if the same room is used again, we would suggest that more be done in the way of draping and decorating. The center of the hall is very dark, and light should be admitted from overhead. With a little outlay in the direction indicated, this hall would be very much improved, and be quite a satisfactory room for our exhibition.

At the close of our exhibition, our Secretary, Mr. Knowlton, proposed that the Pomological Society should make a collection of our standard apples, and forward to the Bay State Fair. To this the other officers readily assented, and Mr. Brown of Newburg kindly consented to take charge of the exhibit. Care was taken to make a small collection of choice apples, rather than a large one of non-descript fruit. Only twenty-eight varieties were taken, and these were

collected mostly in Penobscot and Franklin counties. The exhibit was said to be the finest in the hall, but as there was no premium for best collection of apples alone, it was necessary to enter for premiums in the general collection, which included pears also. In this class they were awarded second premium, \$30. Ten single plates were entered, and seven of them won first premium, two, second premium, and the other, third premium. From this it will be seen that the collection was a choice one, and we have reason to be proud of the result. Our object in exhibiting the apples was not to secure premiums, but to show that Maine can grow as fine fruit as any other section. [See report of Bay State Exhibition by H. W. Brown.]

Early in the spring, the following letter was received from the officers of the Experiment Station at Orono :

ORONO, ME., March 26, 1889.

To D. H. Knowlton, Esq., Farmington, Me. :

DEAR SIR: Your attention is respectfully called to a vote lately passed by the Trustees of the college, a copy of which is herewith enclosed. It remains with you to take such steps as are necessary to carry this action into effect, so far as it relates to the Pomological Society. The understanding is, that the expenses of the advisory members of the council, necessary to their attendance upon the meetings of the council, shall be paid from Station funds. You are also notified that a meeting of the Station council will be held at the college, April 5th, 1889, at 9 o'clock A. M.

Very respectfully,

M. C. FERNALD, *Pres't Station Council.*

W. H. JORDAN, *Director Station.*

Enclosed was the following vote :

At a legal meeting of the Trustees of the Maine State College of Agriculture and the Mechanic Arts, held at the College at Orono, Penobscot county, State of Maine, this day, a vote, of which the following is a true copy, was passed by said Trustees, viz. :

Voted, That the Trustees invite the State Board of Agriculture, the State Grange and the State Pomological Society, each to furnish one representative as an advisory member of the council of the Experiment Station, and that such a representation of said bodies constitute an advisory board of said council, when so elected, and the Trustees of this college duly notified of the same.

Attest :

WILLIAM T. HAINES, *Clerk.*

The Executive Committee at once took action in the matter, and as it was important that the Society should be represented at the first meeting, when plans for experimental work were being outlined, Mr. D. H. Knowlton was elected as advisory member of the council of the Experiment Station. For the work accomplished there I will refer you to his report. We think there is a wide field open before them, and we hope for great results from their investigations.

As most of us are aware, there is considerable discussion at the present time about teaching the rudiments of the science of agriculture in our common schools. Having previously called attention to this subject, I will now simply express the hope that we may take such measures as the Society shall deem best, to properly present this subject to the people, and secure the needed legislation. The education of any scholar is certainly very incomplete without some knowledge of the natural sciences, and this knowledge might be so placed before the minds of the young as to be fruitful of very satisfactory results. It frequently takes but a trifle to direct the thoughts of a youth into a channel which will lead to great accomplishments. John Bartram, a farmer living near Philadelphia, in the middle of the last century, while resting from his plow a few minutes, pulled a daisy to pieces, and being struck by its marvelous construction, left his work and went to the city, and purchased a botany in Latin, and a Latin grammar, and soon mastered so much of the language as to enable him to study his botany, and in a year had botanized all over the country about him, and afterwards became botanist to the King, at fifty guineas a year. He established on the beautiful banks of the Schuylkill, the first botanical garden in America, which resulted, by exchange of plants, in great benefit to both this country and England. I do not think the advantage of introducing the subject will be so much what they learn at school, as it will by awakening thoughts in the minds of many, which will lead to after investigation.

The objection raised by some, that we do not want class legislation, is hardly worth notice. We well know that all the states which are up with the times are already appropriating considerable sums to support colleges and experimental stations, and to otherwise advance the science of agriculture. I am satisfied that we are only to convince the farmers that a little instruction in our common schools in the natural sciences which form the foundation of all intelligent farming, will be for their best interests, elevate their calling, increase the possibilities of those who are to follow them, and

all the legislation necessary will be easily obtained. However much our school curriculum may be extended in this direction, there need be no fear that the farmer will not pay his full share of the taxes ; but all advantage to be derived from extending the knowledge of fruit culture, will accrue quite as much to the merchant, mechanic and professional man, as to the farmer himself. God pity the man who does not, at some time in life, own a few rods of land, which for the cultivation of fruit, if his mind has been properly instructed, will prove a mine of pleasure, and add wonderfully to the health and happiness of his family. The people at large know but little of the great importance of fruit as a part of their daily diet. If this Society could do something to displace a few pounds of pork, by the products of the orchard, the bush and the vine, it would elevate the standard of humanity, and curtail the business of both the physician and undertaker. As civilization advances, the consumption of fruit will very much increase, and the cultivation must be largely extended to keep pace with the demand.

Farmers realize the value of an orchard when grown, but few have faith enough to set many trees. Ten or fifteen years look a long time to wait before realizing any returns. How many orchards of 500 or 1,000 trees, in good condition, can be purchased for double what it cost to grow them. Let us look at the cost of an acre of orcharding, 70 trees. The best of trees will cost ten cents apiece, and about the same amount will set them, in pasture land. The expense for dressing and care, until the apples give sufficient return to pay expenses, will swell the total to \$60 or \$70. And who would not give thrice this amount, plus the value of the land, for an acre of young orchard? We know whereof we speak when we give these figures, as we have an orchard of this description set fifteen years ago, in an old sheep pasture, from which we have taken enough apples to pay all expenses, and which bore this year more than \$100 worth of apples. I do not speak of this as an exceptional yield, but to show what can be done on almost any of our rocky hillsides, with very little outlay.

I do not wish to recommend much that is new, nor anything startling, and yet I believe it is the proper duty of this Society to investigate, and if possible recommend that which will be for the best interest of all. We know that many of our people are frequently sending part, at least, of their surplus to help develop the mines and boom the towns of the far-off West, and too frequently

receive nothing in return but worry and vexation of spirit. There are mines close at home which, if properly worked, would pay much better than the average investment so far away. I beg leave to recommend for the consideration of capitalists the plan of forming a stock company with full power to buy and hold real estate, which shall, through competent officers, secure land and plant orchards upon a scale that will enable them to command the respect of markets both at home and abroad, and not only sell such large lots to better advantage, but all the expenses would be less, the price of barrels lower, and the cost of picking, packing and sorting greatly reduced. None of us here can doubt that such orchardry, intelligently and honestly conducted, will secure larger returns, combined with a minimum of risk. I do not doubt that stock in such a company would always sell at a reasonable price, and any one who wished to realize upon his investment could do so at any time. In competing with other sections of the country, we can claim several advantages, not the least of which is our immunity from late spring frosts, which frequently ruin the fruit crops in other states south and west of us. Land suitable for orcharding is also very low, and Maine apples are popular in the foreign market.

With the obstacles which we must now encounter, in orcharding as with every branch of farming, we must remember that more intellect than formerly is required to make a success, and our people must understand this and train the boys accordingly. Let those who lack the capacity seek employment in the city as salesmen or clerks, and those who have the brains can follow the more independent life of the farmer and horticulturist.

The President's address was referred to a committee consisting of Hon. Rufus Prince, Turner, S. G. Shurtleff, South Livermore, and C. H. George, Hebron, who before the close of the meetings presented their report, which was accepted.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Resolved, That we commend to the people of Maine the recommendations of the President's address in regard to teaching the rudiments of agriculture in our schools, as we believe it would create a love for rural life, the lack of which is from day to day depopulating our rural towns.

Resolved, That as much of our President's address as relates to forming a stock company for the purpose of engaging in orcharding on a large scale, we commend to our capitalists, as we believe it would not only govern in a large measure the price of Maine fruit, but such an association, well managed, would give such returns as would tend to give orcharding in our State an impetus that could be given in no other way.

FOUR ACRES ENOUGH.

By L. H. BLOSSOM, Turner Center.

* "Four Acres Enough" may to some seem of little consequence, but before we cast it aside as a subject unworthy of our attention, let us pause for a moment and consider what we are here for, and what are the objects and aims of this meeting. We have met here for a purpose, and that purpose is to discuss the subject of pomology in some of its many branches. Every year, as we dig deeper into the mysteries of the cultivation of fruit, brings to light, out of the hidden mysteries of the past, something new and unheard-of before. Every year brings to our notice some new and choice variety of apple which claims a place in every orchard; at least, that is what the apple-tree agents tell us, and you all know, who have had any dealing with that class of beings that they can't lie. How many of us have been suddenly awakened to the realizing fact that we have encumbered our farms with too many trees of too many varieties, and almost unconsciously we find our farms burdened with too much orchard. How often we hear a man say, "Oh, I have got ten acres of orchard;" another will say, "I have got fifteen acres;" another has twenty acres, and has ordered trees for two acres more, to be set next spring. Now, to such as these, "four acres enough" may seem to be an absurdity; but stop, my friend, let me ask you a few questions before you tread my little orchard under your feet, and first is this: Do you honestly think that every tree in your orchard is properly pruned to its best advantage? That there are no interlocking branches to rub and chafe each other, and thus cause decay? That your trees are so pruned that the most sunlight possible can get to the ripening fruit, thus putting on that beautiful tinge so dear to the critic's eye, and which naught but the

ripening influence of the autumn sun can bring out to its fullest perfection? And when the pickers come along to gather in the fruits of your orchard, are your trees so pruned that they can readily pass through the trees and gather the fruit, or must they take a saw with them to clear the way? My friend, can you answer this question in the affirmative? While one may, I fear there are too many that can't. Again, have you given your trees all the fertilizing material that is necessary to bring them up to their highest stage of perfection? If not, then again I say, you have failed to derive the greatest amount of profit from the smallest amount of ground, and until you bring every tree in your orchard up to its greatest bearing capacity, I shall claim that "four acres are enough" for farmers in general.

We have all noticed in some parts of our orchards that some of our trees were better than trees in different parts of the orchard; now what is the cause for it? Have we ever stopped to think that the trees standing at the foot of the hill, or in the fence corners, were the best ones in the orchard, and what is the cause for it? It is this: More or less of the dressing that has been applied to the soil has been washed to the lower parts of the orchard by the rains, thus doubly enriching those trees on the lower part of the orchard over their neighbors that stand on higher ground. Now may we not learn a lesson from this, that the tree on the lower part of the orchard bears double the fruit that the one on the higher ground does, one is equally as well located as the other, as far as the natural conditions of the soil are concerned, and the one would be equally as prolific as the other if it only had the same amount of plant food to sustain it?

Now, gentlemen, would it not seem foolish to you for that man to set out another acre of orchard when half that he already has on his farm is starving for something to eat, something to make it grow? Well, now is not this just the condition of nine-tenths of the orchards of Maine to-day? Yes, I think it is, and I think it is time for the most of us to stop increasing our acreage and give better care and attention to what we have already on hand.

In the fall of the year when we go into our orchards to select fruit to carry to our fairs, do we go to the poor, ill-fed, scrubby, limby trees that are half dead with neglect to select our samples from? No, certainly not; it is right the reverse. We go to the trees that have been so pruned that they will not be overloaded with

fruit, and the sun has put on the finishing touches. It is to these trees that we go for our samples. Now if we have a few such trees, as these, let us try and have more of them before we enlarge on our orchard.

What would we think of a man who had dressing enough for four acres of land, if he should go and plow up twice that amount and apply the dressing for the four acres to the eight. It is needless for me to note the result, you all know it must be a failure. And is this any the more true with the corn than with the orchard? Most certainly not, only with the corn we see the result a little more quickly.

The spread of diseases of fruits, resulting from insect depredations, and other causes, might be checked, if not eradicated, if we would but turn our attention in this direction. A very little attention on the part of *all* the fruit growers of Maine would accomplish much that would be of great benefit to us all.

Last fall I was passing through the orchard of a friend, when we came to a tree of Franklin Sweets, many of which had fallen to the ground, and on my calling the gentleman's attention to them, he said they were utterly worthless on account of the apple maggot, and on examining some of them I found them to be completely infested with that pest. I asked him what he did with them; he said, nothing at all, that he had not picked any of them up for two years, they had been so poor, and yet that man was setting out trees every spring, giving *no* thought to that deadly enemy that he was so careful *not* to destroy.

Now to obviate and overcome this evil, to restore and perpetuate our fruits, a change in the manner of cultivating them is absolutely necessary. We must do less planting, and give more attention to those planted. Too many persons in growing fruits practice quite different from that pursued in growing other crops. They act as though all that is necessary is to plant the trees, when, in fact, this is but a small part of the labor that is required to grow an orchard. Because our forefathers grew full crops of perfect fruit with little or no labor after planting the trees, we should not expect to do so now. They had the rich virgin soil, full of all the elements that were necessary for tree growth and the perfection of its fruits. With us, we find all things are changed; we must prepare the land by deep cultivation, and thoroughly enriching it, and underdraining where it is necessary. Fruit trees, to be healthy and vigorous, must have

good cultivation when young, so that when they come to a bearing age they may be capable of rewarding us with a bountiful supply of No. 1 fruit.

Some five or six years ago, while helping my father gather his apples, we kept an accurate account of the number of bushels taken from several of the trees, and I know of two trees, standing thirty feet apart, from which we took twenty-five bushels from each tree; other trees located in different parts of the orchard doing nearly as well. Now let us see what this would amount to, seventy trees to the acre. Calling it eight barrels per tree, it would amount to 560 barrels per acre; now that is better than most of the ten acre orchards will do, so let us cut it down from eight barrels per tree to two barrels per tree, and *then* we have 140 barrels per acre. Now, surely this seems small enough, but to be safe, let us throw off the odd 40 barrels and make it an even 100 barrels per acre, and how many of us, do you think, reach that amount? Very few, I think. And why not? It is just because we fail to give them the proper amount of care and attention. We have been raising too many No. 2 apples, which, taken one year with another, don't pay for handling. Now, in these close times of competition, in order to make the business of fruit growing a profitable one, we have got to so manage it that we can get the greatest amount of fruit possible from the smallest number of trees. If by care and attention we can make one acre yield more fruit than five now do, then we will make fruit raising one of the most profitable industries in Maine. Remember, it is no more work to keep an acre of orchard that will yield annually 100 barrels of apples free from borers and all other insects, than it would one that yielded but 50 barrels. And I believe it is in the last 50 barrels wherein the profits lie.

Some may say, if there is a profit in one acre of orchard, there will be still greater profits in larger ones. This may all be true to a certain extent, but when we increase our area at the expense of what we already have, then I think the profits will decrease in the same proportion. Of course we have fruit growers in our State who make fruit growing the leading business on the farm, to such as these this paper was not written, but for the general class of farmers who have an idea that orcharding is but a sort of recreation which needs but little care and attention. And for proof of what I have written, I will cite you to the many orchards that dot the hills of Maine, and until they show better care and cultivation I shall say "four acres are enough."

DISCUSSION.

Dr. T. H. Hoskins of Vermont. This is a subject which ought to interest every orchardist, and every farmer who undertakes to grow any kind of tree fruit for profit. This requires the closest attention to soil tillage, manuring, setting trees, and care in handling them. Unless they are properly managed they never come to any profit. I take it that it is in this State as in Vermont where I live, the greater part of the farmers realize no profit at all from their trees.

The orchard business is rendered somewhat discouraging by the increase of insects, and before setting out a large orchard I should want to wait to see what is to become of them. The insects injurious to agriculture have trebled during the last forty years, and I do not know of one that shows any signs of leaving. When I began farming in Vermont I had not heard of the currant worm and the cabbage worm. We had the tent caterpillar and have him still. We have had him so long that we should be sorry to lose his company. The codling worm is also an old insect. Sometimes I think he is a very good fellow to thin out our apples. These were the insects which we had when I began orcharding. Of those which have appeared since, this apple maggot is more injurious than all the rest.

It is a great error to set more trees than you can care for, or to set them too close. Those trees which bear young may be set closer than Baldwins and Greenings if they are thinned out at the proper time. They may be set fifteen feet apart at first, but after about fifteen years every other tree should be taken out. In that way something may be made by raising early kinds. I consider the Early Transparent the most profitable. It takes the place of the Early Harvest and the trees begin to bear when very young. They have netted me a dollar a bushel for ten years. They bear heavily. A tree eight feet high will often bear a barrel.

Question. Do you think it would be suitable in this State?

Dr. Hoskins. It will grow anywhere in the State clear up to the Canada line. In those parts of the State where old, standard apples are a failure, it is a "God-send." They come into bearing quicker than the currant bush.

Question. Does it do well grafted into other trees?

Dr. Hoskins. Yes; it does better when grafted into something else.

Question. What is your method of treating trees, beginning with the setting?

Dr. Hoskins. I do not think much of the old-fashioned way of digging a hole as big as a hogshead. A place large enough to admit of straightening out the roots in good shape is sufficient. The dirt should be carefully pressed firmly against all the fine roots. No water at all should be added. Only three branches should be allowed to grow at first. Pruning should be done while the limbs are small. My theory is that it should always be done with the pen-knife.

Question. Would you set trees as soon as the frost is out of the ground?

Dr. Hoskins. Yes, sir; just as soon as possible.

Question. Do you apply any manure?

Dr. Hoskins. Never put any manure in the hole in setting the tree because as the manure decomposes it leaves a vacant space and the roots which pass through this space will die. Manure upon the surface. I manure my orchard as highly as a market garden, and always find that the last load pays the best. It is not necessary to place the manure very near the tree, as the roots will cover the whole orchard. If you should remove the turf from the orchard you would find that you had but one tree. The soil would seem to be filled with one continuous network of roots.

Question. Do you allow grass to grow in the orchard?

Dr. Hoskins. I allow grass to grow in the line of the trees, but generally want to plow between the rows; however, if land is rich enough to bear heavy crops of grass it will generally produce apples.

PEAR CULTURE.

By C. M. WESTON, Belgrade.

I received an invitation from your President to prepare a paper on "Pear Culture," to be read at this meeting, and I could not well decline, as I had been honored with a like invitation a number of times previous, when other engagements prevented me from complying with the request. And it is now with a degree of diffidence that I come before you with a paper for the first time, knowing full well that there are many present who have had a large experience, not only in fruit growing, but also in preparing papers on the same. But I will endeavor to give you a few ideas as gleaned from some over twenty years' experience in the cultivation of the pear, attended with varied successes and failures, trusting you will receive them as coming from one who has had more experience in raising pears than he has in telling how it is done.

You should first select a suitable piece of ground near your buildings. It should have a dry subsoil. If that cannot be had, it should be underdrained, as the pear will do no better in a wet soil than the apple. The ground should have enough animal dressing applied to raise a good crop of corn or vegetables, then thoroughly pulverized, and marked off in rows fifteen feet apart, placing the trees the same distance apart in rows, in the form of a hexagon. I should select seedling trees if they could be found, if not, I would start my orchard from the seed, as I would prefer a pear seed to a tree grafted at the root. Dig the holes for your trees a little deeper and larger over than the roots extend. Have some two inches of loose dirt in the bottom of the hole to place the roots upon, then incline the tree a little towards the southwest, to prevent what I call sun scald, or trunk borer. Put the dirt in around the roots with the hand as closely as you can, lifting up the small roots and fibers as you put in the dirt, so when it settles around them they will be in about the same position as they were when taken from the nursery. Use no animal dressing around the roots of the trees. Then you should mulch the trees with coarse hay, straw or leaves, about ten inches deep, and extending some three feet from the tree.

The ground can then be planted to beans, potatoes, or some other vegetable, and then continue to plant, giving it an annual coating of

animal dressing, until the trees come into bearing. Then leave off the cultivation, and mulch the ground all over, so as to prevent the growth of grass and weeds, and also keep the ground light and mellow. It will need renewing about once in two years.

As soon as the tops of the trees are large enough, I would graft them in the limb, either by splice or cleft grafting, using well known varieties that will give a succession of fruit during its season. I will give a list of a few varieties that I have been fruiting with a good degree of success. First we have Osband's Summer, that will give ripe fruit about the first of August, and are in eating some two or three weeks. Then comes Clapp's Favorite, and if you will commence picking them as soon as large enough, and continue from time to time, and take them into the house to ripen, you will have fine ripe pears for some two or three weeks, until the Bartletts begin to ripen. That is a variety too well known to need any comment from me, except to say no pear orchard should be without it. Next we have the Nickerson, one of the seedlings of old Kennebec, a fine grained sweet pear, excellent for eating, and cannot be easily beaten for canning. Souvenir du Congress, which ripens about the same time, is a bright yellow with a little flush, very juicy and the flesh firm and crispy. The Sheldon ripens the last part of October and the first part of November. The tree is very hardy, and of thrifty growth, but a shy bearer. The fruit is large, round and covered with a light russet, very juicy and melting, one of the best eating and selling varieties we have at this season of the year. The Goodale, one of the most profitable of Maine's seedlings, ripens about the same time as the Sheldon; fruit very large and green; flesh white and of very good quality. The tree is very hardy and upright in growth, an annual bearer and very productive. Later we have the Duchesse d' Angouleme, Buerre d' Anjou, Kieffer, and many others that are highly recommended, but I have not fruited them enough to decide which I should prefer.

As soon as you commence grafting, you will find the trees will require a large amount of pruning until they come well into bearing, which will be earlier than with the apple, thus proving false the old saying, "That he who plants pears, plants only for his heirs." The scions will need cutting back for a number of years after being set.

If you wish the fruit to be melting, juicy and of the finest flavor, they should be picked from the trees as soon as they will readily

separate from the limb by lifting the fruit, and carried into the house, put into boxes or bulk and covered up; the cooler the place they are in the longer it will require to ripen them. If left upon the tree until fully ripe, the most of the summer and fall varieties will be dry and devoid of that fine flavor that belongs to them.

I see no reason why pears cannot be raised in any section of Maine where we can raise apples (except the Ironclads). To be sure, it costs more to raise a bushel of pears than it does a bushel of apples, but they bring more in the market. I see no reason why the fruit growers of Maine should allow other states to furnish the most of the pears that are sold in our larger towns and cities. There is certainly no reason why a majority of the farmers of Maine should not have their little pear orchard, and in that way furnish their families with all the delicious, ripe pears they want for the table, from the first of August till into the winter months, and also to can for the remainder of the year. I have no fruit that children seem more pleased with than a good ripe pear, and I also find that children of a larger growth do not object to them.

DISCUSSION.

Question. It was reported a few years ago that the apple borer would not trouble pear trees. What is your experience?

Mr. WESTON. I am not much troubled with the root borer. The trunk borer troubles me most. They sometimes enter the tree through the little holes in the bark found where the sun strikes the trees in the afternoon.

Question. What course do you take to prevent the cracking of the Flemish Beauty?

Mr. WESTON. I found no way to prevent this, and grafted the trees with Bartlett's, receiving a good crop four years afterward.

Question. I have a tree that has blown quite full, but I have succeeded in getting only one pear. What do you think is the matter with it?

Mr. WESTON. Well, that is my experience with root-grafted trees. In a few years your tree will probably die. I get good results by setting seedling trees and grafting the top. I have about two hundred such trees that are doing well.

Question. What is your opinion of the Sheldon pear?

Mr. WESTON. It is the best market pear we have. You can ship it wherever you can ship the Ben Davis apple. But with me it has been a shy bearer.

Question. What do you do to prevent the blighting of the leaves?

Mr. WESTON. That is a subject that I want to hear something more about. I find that the trees must be cut back until they begin to bear. When the leaves and ends of the limbs begin to die I cut them off and burn them.

Question. At what distance do you set the trees apart?

Mr. WESTON. Some of mine are fourteen feet apart, and some fifteen feet.

Question. I would like to hear from some one who is able to tell us how to prevent the pear blight. We all understand what it is and how it works, and now can any one give us a remedy?

Prof. HARVEY. I do not know that I shall be able to give much upon the point, but will give all that is known regarding it. Until recently, I had no idea that it was so widespread. It is doing a great deal of damage in the Northwest. The disease is a fungous parasite. It is a little organism that works in the tree. It is interesting to know a little of the history of this parasite. The little spores that produce this disease are well known. They live in organic matter, and perpetuate themselves from year to year, so that it is very difficult to destroy the source of these organisms. The ground beneath the trees should be kept clear of organic matter. In such matter multitudes of little spores are produced, and float in the air, alighting on the twigs of the trees. The organisms are made up of little, slender threads. They work in the cells or fiber of the wood. In removing a limb it is necessary to cut back far enough to remove the whole of the organism. The branches removed should be burned. If left under the tree they furnish the most favorable conditions for propagating the spores. As the spores are liable to enter the tree at the points where the limbs are cut, it is better to do the pruning in autumn than in spring. These are all the remedies that have, as yet, been suggested, and we can only make the best of the situation by preventing the disease as much as possible.

EDUCATION IN FLOWERS.

By Mrs. HELEN B. C. BEEDY, Farmington.

Education begins, we know not where—and ends—not here. Whatever stimulates the mind to activity, producing abiding results, educates. Education in flowers begins with the first impulse of love stirred in the heart in admiration of their brightness and beauty; if cherished and cultivated it pervades and happifies the entire nature, broadening and enlightening, until beneath the shadow of the "tree of life" is begun the study of that heavenly fruit which is yielded every month, "the leaves of which are for the healing of the nations." That the tendency of the study of flowers is for good and only good, needs not to be proven to an audience like this. Flowers with all their beauty and wonderful mystery seem to have been given us as a pastime to help over the rough hard places in this work-a-day world, for we have all repeated from childhood,

"God might have made the earth bring forth
Enough for great and small,
The oak tree and the cedar tree,
And not a flower at all."

It seems fitting that a pomological society, a society devoted to the study of fruit should also turn its attention to flowers, for the fruit is only a part of the flower brought to perfection. Indeed there can be no scientific study of fruit that does not necessitate first the study of the entire plant. It is presumable that your education in flowers is well begun and each spring time brings to you new joys in her bursting flowers. Occasionally we meet one like Peter Bell into whose heart nature could never find the way. To whom

"A primrose by a river's brim
A yellow primrose was to him,
And it was nothing more."

Another who boasts that he cannot distinguish the geranium from the chrysanthemum who would think you indifferent at least should you fail to specify among his flocks which are South-downs and which are Merinos. Flowers are flowers, sheep are sheep, and there is a peculiar pleasure in being able to call them all by their specific names. Your education in flowers cannot be *complete* so long as there blossoms beneath your feet a single flower with whose name and habits you are unfamiliar. Many confine their study to window gardening which affords one of the greatest delights of the home-

and should be shared in by each member of the family. Too many fail by attempting the culture of exotics which will not always survive our Maine winters. The hardiest of our plants prove the most satisfactory. Geraniums need but very little care and are always bright with blossoms. Ivies, callas, fuchsias, abutilons and cannas amply repay all the attention they receive—and now that veranda gardening is becoming so popular a new zest seems to be given to the window culture, that there may be an abundance of plants for early transplanting out of doors. Boxes perched anywhere are attractive. The fernery may be a constant source of pleasure. It needs very little care and may be simple in its construction—covered with glass or uncovered—from the Wardian case to a simple plate of moss and ferns. The unrolling of the downy fronds of the ferns affording never ceasing pleasure. The extent to which our native ferns may be cultivated has not been tested as it should be. They are not particularly attractive to the farmer as they monopolize his fields and pastures, but as graceful foliage about our homes, they are unsurpassed. Boxes of violets in the cooler rooms of the house are very pleasing winter decorations. All take kindly to out of door gardening, finding in their open beds infinitely more than “pansies for thoughts.” Who does not feel the contrast between a home made bright with flowers, and one in which, in winter, no plants are seen? and who can estimate the effect upon the lives of those who share such homes, in the cultivation of taste, the enlarging of the moral nature, and happifying the heart?

“To me the meanest flower that blooms can give
Thoughts that do often lie too deep for tears.”

Truly “we are creatures that look before and after; the more surprising that we do not look around a little, and see what is passing under our very eyes.” It is easy to interest children in flower culture and window gardening, but far more easy and satisfactory to lead them to the study of our native wild flowers, “earth’s culture-less buds,” that spring up everywhere about us. God made the flowers bright and sweet, not only to attract humming birds and insects, but the children also. Have you ever taken the baby out into the fields in summer, when the buttercups and daisies were in bloom? You have been impressed with the fact that the love for flowers seems inborn. Sad indeed that so enlightening and purifying an agent should be crushed out of its future life. It is a law of our being that the mind must be helped, stimulated to educate itself.

The flowers are given him and the child naturally loves them, but he must be trained to see and taught to appreciate their ever wonderful growth and development. The savage who roamed over these hills ages ago, had probably the same flowers; and though we hear much of their "medicine men," and Longfellow tells us:

* * * "In even savage bosoms
There are longings, yearnings, strivings
For the good they comprehend not."

We do not know that they ever attained any scientific botanical knowledge. Unaided nature will not accomplish the work. We talk of geniuses, and often refer to the lives of Aristotle, Linnæus, Agassiz, Thoreau and Gray, as botanists whom nature has specially endowed. But if we look into their early history, we find there was a guiding hand in the home that turned their feet into these delightful paths, which to them were often steep and rugged. There is a responsibility resting upon parents in this matter of early guidance. A very little judicious instruction in plant study at the beginning, may mold all the future life. It is not necessary that parents should be able to recognize and name all of our native plants, in order to become competent instructors to their children, but that they should study our more common plants, and know how they grow, is desirable. A very hopeful sign of the times is the formation of adult classes in neighborhoods, for the purpose of reviewing the elements of knowledge, without which knowledge all progress in study is impossible. We are never too old to learn. It is not a difficult matter to acquire the rudiments of botany. Parents and children often make great progress in studying together, and when we consider the great assistance thus given in keeping busy hands and active brains in healthful exercise, especially during the summer vacations, we wonder that so helpful an educator should be overlooked. The methods adopted in plant study must depend upon the individuals pursuing it, keeping constantly in mind that educating is not cramming. The mind must be made to act for itself. Even an adult may go through with the text books in botany, completing a prescribed herbarium, and yet know very little of the science of plants; with no real love for the work that shall stimulate him to pursue it farther. One plant studied in such a way as to awaken a desire to continue the work with others, will do more to lay the foundation for an education in flowers than an entire text book examined in a cursory manner. Having studied one flower, every other becomes to us a new treasure, containing some hidden mys-

tery. And yet we need to go back to our flower over and over again. We have not learned it all. We have known the buttercup from the time we first held it under our playfellow's chin to ascertain if he loved butter. But do we know it? Its perfection of color that no dyer's art has equalled; its shiny petals, its folded flower, its rounded bud so delicately poised, its symmetry and grace, this universal flower, growing in all lands? It might be profitable to question ourselves in regard to many other flowers. Perhaps none are so little studied by us as the firstlings that spring hangs out from her willows, alders, maples and elms. Where do these blossoms come from? How is it possible for some of the elms and maples to ripen their fruit apparently without the aid of the leaves? As we examine the swelling bud of the horse chestnut, removing first its waterproof coating, then its outer wraps, till we reach the woolly packing, we can form some idea of the care bestowed upon the flower so closely folded in its very centre. This we can seem to fathom, but these earlier buds and blossoms seem to defy us, bursting into bloom as if *uncalled* and *uncared* for. Lowell must have studied them, or he never could have written,

“ ‘Fore long the trees begin to show relief—
The maple crimsons to a coral-reef,
Then saffron swarms swing off from all the willers,
So plump they look like yellor caterpillars.
Then grey horse-chestnuts' leetle hands unfold,
Softer'n a baby's be at three days old.”

And when Mother Nature removes her white coverlid, and wakes up her teeming millions of blossoms, each bristling with interrogation points, then it is that we should find a little leisure for the anemones, the violets, the arbutus, the bloodroots and orchids. She sows with bountiful hand, and yet some of her more delicate plants will not stand a crowd, and should be preserved against extermination. Handfuls, not armfuls, ought to satisfy the most untiring investigation. Nearly all of these early wild flowers are susceptible of cultivation, and we may watch them unfolding beneath our windows, even before the snow banks have disappeared from our dwellings. We are greatly helped in our observations by reading those who have learned to see more than we. Ruskin's description of a blade of grass gives every bit of feeble green beneath our feet a new meaning. “Gather a single blade of grass, and examine for a minute, quietly, its narrow, sword-shaped strip of fluted green. Nothing as it seems there of notable goodness or beauty. A very

little strength, and a very little tallness and a few delicate long lines meeting in a point—not a perfect point, neither, but blunt and unfinished, by no means a creditable or apparently much cared-for example of Nature's workmanship; made as it seems only to be trodden on to-day, and to-morrow to be cast into the oven; and a little pale and hollow stalk, feeble and flaccid, leading down to the dull brown fibers of roots. And yet, think of it well and judge whether of all strong and goodly trees, pleasant to the eyes and good for food—stately palm and pine, strong ash and oak, scented citron, burdened vine—there be any by man so deeply loved, by God so highly graced, as that narrow point of feeble green."

Many fresh and suggestive articles may be found in our periodicals. John Burroughs' "Among the Wild Flowers," so charmingly illustrated, takes us to the very heart of the woods, where blossoms in all its beauty our mountain laurel, though found in but few places in our State. Mr. Burroughs tells us that he makes the acquaintance of one or more new plants every season, and only those who have learned to love flowers can realize the untold pleasure in finding, in some of our old haunts, a *new* plant, as if a little stranger had sought our acquaintance, ever after to be our friend. And how like a familiar face seem our native flowers, found thousands of miles from home. Our little blue harebell, growing so abundantly about the cascades of the upper Mississippi, greets us like a messenger from the Pine Tree State, only there it is found with its radical leaves in perfection, which rarely occurs in New England. Many a botanist will tell you that he has visited the Isle of Shoals, that he may watch the pimpernel close its rosy eyes at the approach of the storm, so fittingly termed "the poor man's weather glass."

"Were I, O God, in churchless lands remaining,
Far from all voice of teachers or divines,
My soul would find, in flowers of thy ordaining,
Priests, sermons, shrines."

If you have ever taken a day with a botanist, you are convinced that "nature sells but always at value price." You perhaps became weary while your friend eagerly followed the trail of his sought-for treasure, and heeded not stream or mountain till the prize was won. The pencil and brush are indispensable aids to thorough study in natural history. Children take great delight in illustrating their work, if only correctly directed at first. No more enthusiastic lover of the work has wielded her brush in the study of our Maine flora than Miss Kate Furbish, whose valuable collection is as yet incom-

plete, but already embraces most of our native plants. Miss Furbish is accorded the honor of being the first woman for whom a plant has been technically named [*Pedicularis Furbisha*], an honor in which every other Maine woman may proudly share. The object of this paper is not to urge that we all become scientific botanists, but that, by learning to read nature in her works, we shall all find a secret of happiness in our own lives, and help to unfold it in the lives of those for whose future we are responsible; that parents and teachers, by leading the children early to the pure and helpful study of flowers, will so preoccupy their minds that unrest and evil may not so readily find a lodgment there; that home shall always be associated with the most beautiful things God has given us—the flowers; that by thus awakening their interest in all that pertains to the culture and adornment of rural homes, this vexed question, “How shall we keep the children on the farm?” may find, if possible, a more satisfactory solution. It is not desirable to keep them all there, but it is desirable that they should love and cling to it. Piti-ful, indeed, is this picture given us by a Scottish writer: “There are, in Scotland, ten thousand homes, once sweet and beautiful, each a little paradise, of which there is no trace of the cottage, not even the grassy mound that marked it, and the question naturally follows: Where are the healthy, laughing peasant boys and girls that such homes bred and reared? *They are sweltering and struggling for existence in the towns and cities.*” The author further adds: “I am told this must be, that it is all the result of economic laws. But I confess to a deepening conviction that it need not be, and that the loss to the nation, as a whole, is vital, if not irreparable.” Is there not a like process going on in our own State? Are the boys and girls encouraged to remain upon the farms as they should be? The tendency to join the small farms to the large ones, and thus blot out the homes and drive from our rural districts its most valuable population, its small farmers with their families, *is degenerating*. Consult the school records. Only two or three scholars now where often thirty to forty bright, happy boys and girls made music in the air for miles around. This question *is worthy* the attention of a society like this. Can you not, by the dissemination of knowledge and the encouragement of fruit and flower culture, help to give necessary stimulus to those busy brains, and attract to these homes its richest heritage, its boys and girls? Look the world over—where can be found a more favored spot than our own State of Maine? Of all

the forty-two stars that decorate our national flag, is not the eastern star the most steadfast in its light? Consult the daily press at any season of the year. Shall we not find *floods, tornadoes, cyclones, blizzards, malaria* and *deadly heat* doing their dire work in all the other states, while the dear old *State of Maine* moves on the even tenor of her way unmolested by any such destructive agencies. Even the winter storms are now talked of as old fashioned. The Maine people, the original stock, were exceedingly practical, and we, their descendants, are apt to question any departure from the old way with—Will it pay? Will this education in flowers pay? If this life were all, perhaps not; but if this existence is given in which to develop capacities for a higher and broader life, yes! a thousand times, yes. Very little original work in botany has been done in the State. There remains a vast field as yet unexplored; our extensive coast line with its variety of *algæ*, our broad forests where new plants are springing up with the changes constantly taking place, our numerous lakes and streams, all await the coming specialists who should be *native* born and *trained*, that they may love the work and unfold to us in all its richness our native flora. In order, then, that we as a people may be intelligent in plant study the home should lay the foundation of the work, the school should continue and give direction to it, and societies like this should foster and encourage it

THE DIETETICS OF FRUIT.

By C. D. SMITH, M. D., of Portland.

If he who makes two blades of grass grow where but one grew before, be hailed as a public benefactor, how much more deserving of praise are they whose efforts are directed toward increasing and improving what has always been esteemed as one of nature's best gifts to man. It is, I believe, a recognized truth, that in any business or profession, the best collective results are obtained from combined effort in the direction of certain special lines, and in accordance with this fact, societies such as yours have multiplied themselves, doing work not yet appreciated by the public as it should be, but of infinite benefit to themselves and all who profit by their enterprise. It is, therefore, because of sympathy with this method of work, and a desire to render such assistance as I may be able, by placing before you some facts which may enable you to feel an

additional satisfaction in promoting the cultivation and consumption of fruit, and *not* because of any special knowledge, that I venture to ask your attention to some facts with reference to the "Dietetics of Fruit." By this expression I mean the uses of various fruits as articles of diet in health as food, or as quasi-remedies to avert disease, or as corrective agents in disease itself.

If I depart somewhat from the restricted field, which might perhaps be implied by this title, it will, I hope, be pardoned, since a paper dealing with familiar subjects in a popular way must always fall short of its intended aim if too technical in character. I should also labor under the disadvantage of dealing with a subject necessarily limited by the fact that, judged by the standard of *nutritive* value alone, fruit has a field measurably limited. At this day how useless a task would it be, to accumulate evidence of the general value of fruit to man; it has established itself as among our staple articles of domestic use; it has, by reason of the consequent demand, become an article of commerce, involving large outlays of money for cultivation, and costly facilities for placing it before the consumer. Indeed, its use and appreciation are almost universal, and this fact alone makes more interesting to the student of dietetics his investigations into the actual food value of fruit. Perhaps this value and the true use of fruit may be more readily apparent if we consider briefly the nature, use and services of food in general, since then we shall be able to estimate just what in fruit is of use to the body, and what reasons if any prevail, for such widely spread appreciation as it receives.

It is true that scientifically considered "we eat to live," but how, profiting by that process, the body is enabled to live by eating, is a matter which has been the subject of most elaborate experiment and profound research, involving the labors of some of the most distinguished scientists and economists of the world. In considering the question of food, we are dealing with substances which either induce or contribute to certain chemical changes within, or of the body, whereby its growth is promoted and preserved, and its waste renewed. There are, in such a discussion, certain factors which most prominently assert themselves, and which cannot be ignored, and that they have a special bearing upon the use of fruit as an article of diet, will be easily recognized. Not the least of these factors of special interest to those of slender income, is :

1. The relation of economy in *use* of food, to its cost ; in other words, how may the inevitable expenditure for necessary subsistence be reduced to its lowest terms by a judicious selection of the diet?

2. The selection of food with reference to what we expect to accomplish in the body, which involves the adoption of food to work in producing and preserving muscular and nervous energy.

The solution of the second of these problems, the selection of foods, will in a measure furnish a key to the first. It is doubtless true and capable of proof that a useless amount and quality of food is consumed by the well-to-do and the needy as well ; that an excess of meat and sweets is a potent source of disease ; that ignorance of proper selection of desirable and agreeable food causes much loss, for which reason the extremely poor generally being those who practice the least economy, suffer most ; and that food may be wasted and thrown away in the stomach, as well as into the waste barrel.

To the science of chemistry we are indebted for the knowledge which enables us to assert with reference to these questions. Thousands of trials and experiments have been made in the laboratories of Europe upon animals of many kinds, and human subjects of both sexes, all ages and weights. The aid of chemistry, physics and physiology, by the most delicate apparatus, has been worked, and the most gratifying result is the application of the knowledge thus gained, to promote the material interest of mankind. Chemistry analyzes the human body and finds it to consist of certain elements and compounds. It demonstrates how by vital processes they are held together, and how they serve their functions, and returning to the forms from which they originated, pass away and are replaced by new.

The lesson it teaches when applied to food is simple to understand. It takes our various food substances and by resolving them into their component parts, tells us how much of the material used in the body each food contains, how it may be utilized, and how in nature's laboratory it becomes changed or converted into the needed form.

Out of the more than a hundred different compounds in the human body, it will be sufficient for our purpose to outline those of principal importance, since after describing to you the chemical constituents of different fruits, I shall ask you to determine for yourselves the advantage of a judicious mingling of fruits with other food.

1. The first of the compounds is *water*, most valuable as forming a great part of all animal and vegetable tissues ; it forms seven-

eighths the weight of milk, one-fourth that of potatoes and lean meat, one-third of bread, a little more than one-half of well fattened beef or mutton, and one-eighth of flour and meal; nearly 80 to 90 per cent of most ripe fruit. The whole body of an average man contains three-fifths water.

2. If our bodies be burned, about six per cent will be found remaining as unchanged mineral matter; for example: phosphate of lime from bone, phosphate of potassium and chloride of potassium from muscle; these mineral matters make from one-half to one to two per cent of our vegetable food, and 31 per cent of animal food.

3. Besides water and mineral salts, there are organic compounds which make the bulk of blood and muscle, called *protein* substances, a name I ask you to remember, as these compounds are the most important of all the ingredients of foods.

4. Are the fats making 16 per cent of average weight.

5. Are substances called *carbohydrates*, that is, materials including sugar, starch and dextrine, containing the same chemical elements as the fats, though in different proportions, and making only a fraction of one per cent of a human body. Therefore we may tabulate somewhat as follows:

In the body of a man of 148 pounds,

Water	90
Proteins	26.6
Fats.	23.0
Carbohydrates	0 1
Mineral matters ..	8 3
	<hr/>
	148.0

When we consider the actual value of these compounds as nutrients, we shall find that the water has very little value, and the main points to be obtained are these facts derived by an extensive series of experiments made at the national museum in Washington, by Prof. Atwater:

1. Our bodies and foods consist of essentially the same materials.

2. The actual nutritive ingredients of our food may be divided into four classes, proteins, fats, carbohydrates and mineral matters.

3. The nutrients of animal foods consist mainly of *proteins* and fats. Those of the vegetable foods are largely carbohydrates.

4. The different nutrients have different offices to perform in the nutrition of the body. The demands of different people for food

vary with age, sex, occupation, and other conditions of life. Health and pecuniary economy alike require that the diet should contain nutrients proportioned to the wants of the user.

The phenomena attending the process by which a portion of food, the familiar slice of bread and butter, and a bit of meat, for example, is utilized in the animal economy, are varied and complex, but an examination of their minutiae is not indispensable to our present discussion; it will suffice to carry in mind the fact, as exemplifying the use of a true food, that in the bread and butter and meat we have the carbohydrates in starch and sugar, proteins in meat, fats in butter, and mineral salts. The carbohydrates are the fuel which furnishes animal heat, any surplus being converted into fat. The proteins repair the tissues as they are used up by the normal waste, are changed into fats and carbohydrates, and any excess is consumed for bodily heat. The mineral salts form the blood salts and are also transformed into the mineral matters of bone and other tissues, are stored up in the body as fat, the excess being turned in as fuel. Nature is wise, and supplements the processes attendant upon the use of food, by providing the animal with nerves of taste, and a sense of hunger which we call appetite, and the nutrition of the body is thus secured. An old writer has aptly expressed this wise provision for the care of the body, when he says: "In appetite we have a guide in respect of the *times* of taking food and the *quantity* to be taken;" so taste is a guide in respect to the *kind* of food. The discrimination of food with reference to the wants of the system is the evident purpose of the sense of taste, and the enjoyment connected with this sense was designed to afford a security in addition to appetite for adequate alimentation. Were this the whole secret of the food question, there would be no difficulty in supplying the bodily needs regularly and simply; but it becomes often only a question of the gratification of taste, and we make the mistake of confounding the perverted cravings of that special sense with the food demand of the body. In this way, many substances and articles of diet agreeable to the taste, have accorded them a mistaken value as nutritives, when in fact they may consist almost wholly of substances which are inert and of little value.

Doubtless many of you have queried what all this has to do with the dietetics of fruit; a very proper question, and deserving of a reasonable answer. My reply is, that having shown you what food must contain to render it nutritious, I shall try to show you what

fruit contains of a nutritive character. And my other reason was, to provide myself with a breastwork of defence, if perchance I appear to oppose any preconceived opinions any one may have upon the question of fruit as a food. The great value of fruit as an *article of diet* is quite another question, and one which I hope I may be able to approach, and leave, with the commendation of those whose experience as specialists in rearing and developing fruit, surely entitles their opinions to the most ready attention and acceptance. Repeated experiment has demonstrated the fact that no one article of food, or class of foods, will suffice to keep the body up to the best standard of nutrition, unless the demands of climate have some modifying influence, as in the case of the Esquimaux, who live almost entirely upon fat, which is essential to maintaining their bodily heat. Perhaps we cannot rightly estimate what an inconvenience the deprivation of all fruit would become, having always been accustomed to it. To the rich it would mean the loss of one luxury; to the poor, parting with an abundant and cheap variation of a necessarily economical, dietary, and a substitute for expensive green vegetables; and to the sick, the loss of a grateful, delicious and refreshing comfort. Botanically considered, we know fruit to be the ovary of the parent tree, containing in the seed concealed within, the germs intended by nature to reproduce its kind. It is probable that this perpetuation of kind was only the original design, the type of all fruit being usually of a simple character, destined only to produce the seed; size, flavor and other qualities which combine to render it agreeable to man, are the results of careful and intelligent effort to make the most of nature's proffered possibilities. A proof of this lies in the fact that the choicest varieties and forms of cultivated fruits, when left alone, invariably revert to the natural type. Fruit of all kinds consists chemically of water, sugar, free acids, albuminous substances and salts, arranged about proportionately in the apple, for example, as follows: Water, 88.0 per cent; sugar, 7.58; free acid, 1.04; albuminous substances, 2.94; salts, 0.44. If you will for a moment allow your attention to revert to the table or compounds in nutritious foods, essential to the repair of waste, to the making of new tissue, and the origin and preservation of animal heat and energy, you will see that the proteins, which include albumen, "the tissue builders," are in a very small proportion. There is no fat to help build normal tissue, or act as fuel to keep the body warm. There is plenty of water; most of the solid

matter, is sugar, with salts in small amount. No one could keep warm and grow fat on a diet of apples, oranges or grapes, as he would on baked beans with plenty of pork; pears, berries and plums could not be taken in quantities large enough or often enough to make bone, fat and muscle, as would milk, meat and vegetables. Notwithstanding this, there is demonstrated the fact, and greatly to its credit, too, that fruit has a place and fills it, that the meats, the butter and milk cannot assume.

The value of fruit as an article of food of *supplementary* usefulness cannot be gainsaid; and if I have not already wearied you, it is of some of these uses that I wish to speak. Let us first understand what of the chemical constituents of fruit are utilized in the body. First, the water, as when taken as a beverage, or as a part of other food, is indispensable to give to the blood and secretions the fluidity necessary to the performance of their functions; it also serves as a solvent to facilitate the introduction and discharge of substances naturally solid. In all the tissues it serves to maintain their special consistency, such as flexibility or elasticity. The proteins, though very small in amount, contribute as well as they may toward making new tissue of all kinds; sugar helps create animal heat, and adds a little to the store of fat; the vegetable matter the indigestible portion of fruit, when immature, predominates, and is diminished in proportion to the ingredients; as ripening progresses, this is almost wholly thrown out as waste material. The acids, sugar and salts are the elements which give fruit whatever value as a nutrient it may possess; how, we shall presently see. To these components, combined with certain faint and little known aromatic ethers, are due that which we recognize as the characteristic flavor of various fruits. They are called malic acid, found in the apple, pear and quince; tartaric acid, characteristic of the grape, and existing to a certain extent in other allied fruits; and citric acid, peculiar to the lemon, lime and orange. Now it is a part of nature's system that nothing can be appropriated by the body for its uses, except in the way nature has ordained; so when malic, citric and tartaric acids find their way into the body, in the form in which they existed in the fruit, in combination with sodium or potassium, as the case may be, nature utilizes them as material to obtain the carbonates of soda and potassa, whose office it is to keep the blood alkaline, so that its vital functions may not be interrupted. Herein lies the great value of what are known

as acescent or acid bearing fruits and vegetables. Fortunately, we are not obliged to bear this in mind, and continually think of its necessity when we eat our green vegetables in the summer, our apple pies, our Shaker apple sauce, our baked apples, our orange or our bunch of grapes. Nature has ordained that the body shall speak for itself, and so we spice our meats and fish with an abundance of wholesome vegetables and fruits, and the blood and other tissues are all the time extracting from them what they need to keep them in repair and running order; another illustration that "we eat to live," and our free agency in the selection of our food is perhaps not so great as we fondly imagine.

I fear unless we begin to specify, our paper will be in danger of ending without any reason for its adoption of its somewhat pretentious heading. The pear of European and Asiatic origin is a striking example of what painstaking cultivation can accomplish with a fruit originally utterly useless for food; for now it affords, in its different varieties, a fruit so rich and delicious that it would seem the limit had been reached. The pear carries a large proportionate amount of sugar, and to this it owes its great attractiveness. This large amount of sugar enables its expressed juice to afford a greater measure of alcohol than can be derived from the juice of the apple, and this, when fermented, is called "Perry," capable of being turned into better vinegar even than cider. This perry is used as a beverage in large pear-growing districts, and a curious fact is mentioned in this connection, that in some countries, when the fruit is so sour that hungry pigs will not *smell* of it, and the juice from the bitten portion is so acrid and harsh as to cause long continued heat and irritation in the mouth, after being expressed it becomes rich and sweet, with no more roughness in taste than some wines. A tree in Herefordshire, England, is said to have produced fifteen hogsheads of perry in one year; the branches bent down until they rooted, covering half an acre of ground. Pears help out the monotony of our various apple dishes, and may be made a valuable addition to the dietary in the form of preserves, marmalades, sauces, jellies, or boiled, baked or stewed. Well spiced, they may be preserved in vinegar as excellent pickles. The pear was, by old writers, supposed to afford an antidote against certain poisonous fungi.

The quince is a fruit which has long since yielded precedence to more esteemed and aristocratic cousins. The Greeks honored it by

carving it among the decorative sculptures of their temples, and looked upon it as an emblem of happiness and love, certainly a more æsthetic position than was ascribed to it by the boy whose idea of its usefulness had been tinged by his mother's cookery; for when asked by his teacher in botany some of the uses of the quince, replied, "To spoil apple pies." The dried fruit is now used by the house-keepers of southern Europe to perfume their stores of linen, much as our New England housewives use orange peel, lavender, rose leaves and clover; possibly the quince may be one of their agents for similar use; of that I cannot affirm. It is a most excellent fruit for preserves, jellies and sauces, either alone or with other fruits, to many of which a little of the quince flavor imparts an additional zest. From the liquid with sugar is made a good wine. Medicinally, the quince has certain virtues; a decoction of the fruit has been said to cure asthma. Its juice is thought to be a corrective of nausea; the ripe fruit eaten raw is said to be good for spitting of blood, swollen spleen, dropsy and difficulty of breathing, and such a claim for general therapeutic excellence impels me to say, that, as a rule, articles which are heralded as sovereign cures for many diseases in general, are usually not cures for anything in particular. Actual experience has, however, accorded to the quince certain well defined properties of therapeutic value. Its astringency renders a syrup prepared from the ripe fruit a serviceable remedy in certain diarrhœal affections. The seeds contain what medicinal virtue the fruit possesses. Their hard envelope abounds in a mucilage which may be extracted by boiling water, and may be used like other mucilaginous substances in catarrhal conditions of the mucus lining of the bronchial tubes, probably acting reflexly as a soothing application to the throat, thus allaying dryness and cough. For the same reasons this mucilage of quince seeds may be used as an application for sore lips or inflamed eyelids.

Most of us have become more or less familiar with the agreeable properties of the plum, through the medium of the various domestic processes by which this fruit is preserved and stewed. The general properties of the plum render it of considerable value when it is desirable to correct deranged intestinal functions by a regulated diet, rather than by a resort to drugs. When eaten cooked or raw, half ripe or green, the effect is astringent, but when fully ripe, rather laxative. The sloe-plum, which is cultivated to some extent in England, furnishes a juice which when fermented makes a wine not

unlike new port, and is used to adulterate other astringent wines. The apricot, which is a variety of this fruit, is highly esteemed by the Chinese, and by them prepared for winter use in a manner which there seems to be no reason to doubt might be employed satisfactorily among us. After removing the stone, the fruit is dipped several times in its own juice, and is then slowly dried in the sun. They also take this fruit, stewing or boiling it until dissolved, add honey and vinegar to it, making what they regard as a pleasant drink.

‡ The cherry is a fruit of universal distribution, and justly esteemed for many excellent qualities for table and medical use. In many parts of Germany, a preparation called "Kirschensuppe" is made by stewing cherries with water and sugar, slightly thickened with potato flour, forming a dish which the rural population uses extensively as food. A wine called Kirschenwasser is made by crushing the fruit and stones together, adding water to the pulp, and fermenting. Inasmuch as it requires to make one pint of this cherry water twenty pints of pulp, it is as expensive as brandy. Fresh cherries crushed and distilled, make a liquor of astringent quality, useful to allay the paroxysms of whooping-cough, or to relieve the irritation of ordinary colds attended by spasmodic cough. This property is doubtless due to the presence of hydrocyanic acid, which exists in minute proportions in the seeds of various fruits, like the peach, cherry, apple, almond and plum, whence is derived that slightly bitter taste. This acid, in a large amount, is a powerful poison, and is medicinally valuable from its property of acting in minute doses as a paralyzer of spasmodic action. It is not uncommon to hear of cases of poisoning, where children have gorged themselves with the meats extracted from cherry or peach stones; it is due to the presence of this acid. Everyone is familiar with the valuable medicinal properties of the combination made by soaking black cherries in rum, by which the astringent quality of the fruit is preserved and rendered useful. The acid varieties of the fruit make excellent tarts and pies, and the sweeter kinds may be subjected to all the various preserving processes with which our New England house-keepers are familiar.

The peach is a fruit the use of which is so well known that I cannot hope to add anything to your present knowledge, except to say that as an article of diet it is strongly diuretic, and at the same time somewhat laxative.

It is probable that no fruits are so indispensable^d to the inhabitant of the countries where they flourish as the so-called bread fruits of the Pacific Islands, the date and fig. They are literally meat and drink, forming the staple food of the countries in which they flourish. It is said that no Persian cook is considered competent unless she can serve a different dish of dates each day in the month. It is the sugar of this fruit which renders it so valuable, and sugar having a real food utility it is easy to see that the demand for the date is based upon sound physiological grounds. Of course much depends upon becoming accustomed to any dietary regimen, and the eastern nations subsist upon a food of which we should soon tire. It would seem as though no fruit grows upon which the ingenuity of man, civilized and savage, has not been expended to produce a drink, and the date is no exception, for date paste made into an infusion with water, is said to make a pleasant drink, and the sap of the tree drawn from incisions in the trunk, is the so called date milk, which when fermented makes a most potent wine. The production of date sugar forms no inconsiderable industry in British India, seven to eight pounds of sugar from 120 to 240 pints of the juice, being an average result, the total annual yield is something like 10,000 cwt., selling for one-fourth less than sugar from the cane. The dried date of our markets is pleasantly laxative, and forms an agreeable addition to the dessert. The fig is a fruit which comes to us in a dried or semi-dried condition, and is as cheaply within the reach of all as our most common domestic fruits. Its valuable laxative properties have always been recognized and utilized, and it is employed as an ingredient of many mixtures administered for the relief of habitual constipation, as the confection of figs and senna. Its large proportion of sugar and mucilage renders it an agreeable and wholesome food, held in the highest estimation in the countries where it is indigenous. This appreciation of the fruit has not been developed in modern times either, for we are informed that the children of Israel murmured against Moses for leading them where the fig tree did not blossom. The Grecian athletes made the fig their staple article of diet during their training. At Rome the dried fruit was extensively used in place of bread. It is related of the fair Queen of the Nile, Cleopatra, that she cherished for the fig a particular favor, possibly by reason of its popular reputation for retarding the formation of wrinkles. Pliny, the Roman historian, ascribes to the juice of the fig tree the property of imparting a fine flavor to meat. This claim may have had some

foundation in fact, since it is true that meat hung in the shade of fig trees will become tender without decay. As a medicinal agent it has certain uses, to the most valuable of which allusion has already been made. As we obtain the fruit in its dried and pressed state, too free indulgence is apt to be followed by saccharine fermentation in the stomach, causing flatulence, pain and diarrhœa; moderately used, it is a valuable substitute for cathartic remedies. Figs are occasionally made into a poultice for application to external inflammations, we find them to have formed the chief ingredient in that poultice which the prophet Isaiah prescribed for the afflicted Hezekiah when smitten with boils. A pasty mixture of milk and figs is commonly recommended by empirics as a cure for cancer. It is, perhaps, needless to say, of no avail, and can only act as a source of dangerous delay when timely surgical interference may ward off and assuage the sufferings of a deadly disease.

The orange, lemon and limes, the latter a variety of the lemon, are fruits whose virtues, as agreeable, delicious and refreshing additions to our tables, need no additional encomiums; but no fruits are of more real value than the two last, and solely by reason of the great amount of citric acid afforded by their juice. Allusion has already been made to the manner in which this acid supplies the blood and other tissues certain essential elements, and as the juice itself cannot be successfully preserved for any considerable length of time, it is utilized by extracting the acid in crystalline form. The rind of the lemon contains an essential oil, and is used as a flavoring to certain medicines. The juice of the fruit, for reasons first stated, is cooling, and forms a refreshing draught in fevers. It may be given in the form of lemonade, or with soothing drinks, like the decoctions of barley and flaxseed. The latter combination is of undoubted utility in certain dry, harrassing coughs, attended with the formation of tenacious secretions. The virtues of hot lemonade are familiar in all households for its effect in warding off our customary winter colds, by reason of its power to stimulate the secretion of the kidneys and skin. One of the most beneficial effects of this fruit is in its power to prevent and arrest the disease known as scurvy, to which crews of vessels, or other companies of men, long deprived of fresh vegetable food are peculiarly liable. This disease is one of disordered nutrition depending upon the impoverishment of the blood which is deprived of those acids necessary to supply it with its essential salts. This condition is called technically a scor-

butic condition, and vegetables or medicines which tend to counteract such conditions are called anti-scorbutics. Before the days of canned fruits and vegetables the ravages of this disease were frequently dreadful. In the English navy no ship is fitted out without an abundant supply of lime juice, which is regularly issued as a ration, and has gained for them, from the seaman of the merchant service, the appellation of "Limers." The lime juice of commerce is prepared by dissolving the crystals of citric acid in water, in the proportion of $9\frac{1}{2}$ drachms to the pint, with the addition of a little oil of lemon. It is extremely difficult to preserve the expressed juice without decomposition, and it cannot be made to retain for any lengthy period its original flavor, in spite of sealing at a high temperature, or the addition of alcohol, hence the use of the crystals of the acid is the most satisfactory.

The grape and the apple I have reserved for the last consideration, because they are the source of wine, cider and vinegar, articles of great commercial importance, and most interesting in their processes of manufacture and their use, as well as abuse. Apart from the very limited food value of the grape as a raw fruit, or in the dried state, our chief interest centers upon it as the source of wine. Cider, as such, being valuable for the alcohol it contains, the remarks upon the use and effect of wine may be considered applicable to it as well. One of the first trees to flourish after the deluge, the grape, has proven to man no less a blessing than a curse. Among all nations acquainted with the vine, the product of its fermented juice has been deified in song and story, and debased by vile imitations. The grape, consisting largely of juice and containing but little fleshy matter, is one of the least nutritious of fruits. It is strongly laxative, and its injudicious use quickly gives rise to dysenteric affection. Systematic consumption of the fruit fresh from the vine has been said to be of service in arresting pulmonary complaints, but in the light of present knowledge this must take its way to the hereafter of thousands of exploded cures. Grape leaves, containing tannin, are sometimes dried and powdered and administered as an astringent medicine. Sugar and tartaric acid fix the value of the grape. From one we obtain an important article of cookery, from the other, alcohol.

The importance of the wine industries of Europe and America need no reiteration. Nor do I feel called upon to do more than present a statement of facts relative to the much mooted question of

the advantage or harm of alcohol to the animal economy. I do wish to speak briefly about some interesting facts connected with its manufacture, since our knowledge upon the process of fermentation has within the past few years undergone a great transformation. First, a few remarks in general. Wine grapes are not regarded as best for table use, not possessing the requisite fineness, sweetness or flavor. As to the value of a particular grape crop for wine, much depends upon climate. A summer whose mean temperature is below 67° will not produce a valuable wine. A season unusually stormy or devoid of sunlight affects decidedly the flavor by decreasing the production of the sugary elements. The effect of temperature upon the quantity and quality of the wine product is also marked. The cold, inclement seasons of 1833 and 1837 in France produced wines scarcely drinkable.

In preparing the juice for the fermentation process, the fruit is subjected to the ordinary crushing and expressing methods. The residue left after the pressing is used to make a thin second wine, but in some districts of Southern France, previous to being thus used, it is utilized to administer vapor baths by the halt, lame and variously diseased peasantry of the surrounding villages. The pulp, carried to cellars, is laid up in heaps till it becomes hot through fermentation, a hole is then made into the mass, and the patient either gets in all over, or inserts the offending limb, if the application be only local. It is necessary to undergo this steam soaking process in a place well provided with ventilation, otherwise the alcoholic and carbonic vapor would cause headache, intoxication, and even syncope and suffocation. It is supposed that this operation acts like an ordinary steam bath, except that the alcoholic vapor is more penetrating. It is easy to see some grounds for the claims of success which are made for it in the treatment of old rheumatism, sciatica, and indolent tumors. The vintage is impatiently awaited by those who have chronic maladies, and they go up, a long procession of debilitated, abbreviated, and otherwise impaired humanity, as pilgrims toward some ancient shrine. I do not know if apple pulp has ever attained such a curative reputation. For comfort and peace of mind and stomach, let us hope that in New England more modern methods may for a time longer continue to prevail.

The sap of the vine after fermenting is said to possess the power to remove natural spots and stains from the skin, to cure chilblains, and to rapidly remove the effects of intoxication. This latter claim

strikes one as founded upon the principle which cures the bite of a dog by application of its own hair. The process of fermentation, by which a solution of sugar and acid is converted into alcohol, or, if carried still farther, from the alcohol into vinegar, has been the subject of most acrimonious debate among the foremost chemists of the world. Up to 1872 the chemical theory upheld by Liebig, the German chemist, was accepted as definite and satisfactory. This held that the expressed grape juice, having been set aside in large vats, the vegetable albumen of the juice absorbing oxygen from the air, decomposed, and in that state became a ferment to the sugar, breaking it up chemically into alcohol and carbonic acid. This has been shown to be true so far as decomposition of the sugar is concerned, but the cause of the process has been demonstrated to be something entirely different.

It was found by Pasteur, the eminent French scientist, that the decomposing process whereby sugar is destroyed and alcohol results, is due to the presence of a microscopic vegetable organism, and thus has arisen the physiological theory. This fungus is always present upon the outside of fruit, and after the pulp is crushed and the juice expressed, is of course mingled with it, then the fungus must have oxygen, and finding this in the sugar it seizes upon it, chemically breaking up the sugar and changing it to alcohol and carbonic acid gas, the latter rising to the surface in bubbles, a process we have all observed in the so-called working of cider. Every liquid capable of fermenting has its own peculiar species of fungus, named accordingly.

Wines and cider of course owe their useful properties to the alcohol which they contain, the percentage varying according to the amount of sugar present in the juice. Wines which have in fermenting used up nearly all the sugar contain the most, from 19 to 25 per cent and from the lack of sugar are called dry wines; they are strong, and like port and sherry neither sweet nor sour. If on the other hand the ferment be scanty and only a small proportion of the sugar be transformed, the result is a sweet or light wine. If the wine be bottled before fermentation is complete, the gas will not all escape, but will impregnate the wine, making it effervescent and sparkling like champagne. So called rough wines owe their harsh taste to tannic acid derived from the skins and vegetable part of the pulp. The acidity of wine is due to carbonic acid or tartar.

The question of whether alcohol is a food or not, is one which will always be discussed and never settled until the parties to the different beliefs can agree to mutual concessions. I shall content myself with a simple statement of fact with reference to its effects administered in health and disease. Alcohol is, we all know, universally consumed, but in health it is useless, of no good result, and likely to be absolutely harmful. Habitual use of sherry, port and Madeira tends to produce gout and congestive diseases. All wines used in excess weaken the functional activity of the stomach, and induce congestion of all the viscera. As an article of medicine it ranks among the first. In the convalescence from continued fevers it is of great value. In low febrile affections, if it increase the fullness and lessen the frequency of the pulse, soothes delirium and induces sleep, its use may be continued with advantage; if the opposite effect, then it should be omitted. The sparkling wines are most sedative to the stomach and most heady; but as they contain considerable sugar, acid fermentation and headache are likely to follow their use. The sweet wines have usually considerable alcoholic strength, but the appetite soon tires of them and they disorder the stomach. The red wines, having a good deal of tannin, are apt to cause constipation and increase tissue waste.

To the grape we are indebted for pure cream of tartar. Tartaric acid of commerce is wholly prepared from a substance called argol, or tartar, which is an impure tartrate of potassium, deposited from grape juice during fermentation. This substance is purified by hot water with the aid of pipe clay and animal charcoal, to remove the coloring matter of the wine. The deposit resulting from this process is cream of tartar, and from this is prepared, by various chemical processes, the crystalline tartaric acid, which forms with different salts such valuable medicinal substances as tartrate of sodium, Rochelle salts and tartar emetic.

When we come to consider the apple we must confess our inability to do justice to its many excellent qualities. The ancient fable relates that when the Goddess of Wisdom competed with the other divinities to produce the most perfect work, the result of her handiwork was a fruit tree. Familiar as we are and appreciative as we all ought to be, of the produce of our apple orchards, we must admit the excellence of her judgment. Those of us who are proud of our New England origin, and who have not yet deserted her for the more liberal promises of western skies, will never easily admit the exis-

tence of any superior or more useful fruit. Other fruits may be more luscious, more delicate in flavor, more beautiful to the eye; but the apple surpasses them all. If beautiful, they are transient, while the hardy apple constantly ministers to the demands of our tables and asserts a decided superiority in its comparatively easy production, its variety of flavor, its endurance both fresh, dried and preserved, and in its multiplicity of uses as food. Besides affording a welcome addition to the dessert, apples combine nutriment enough with water and agreeable acids to render their use in the ripe state highly beneficial; their general effect is mildly laxative. Apple water, made by slicing up two good-sized apples in a quart of water, allowing it to simmer and then boil down to a pint, makes a most refreshing and cooling drink for patients suffering from febrile affections. Whether stewed, fried, baked whole or in pies, or made into jelly, they form a most valuable diet, for by keeping the blood supplied with those acids which are necessary to maintain its vitality, they take the place of green vegetables at a time when such are difficult to procure, besides being, when thoroughly cooked, more easy of digestion. Many a person who has arisen from long, exhausting fevers, when the diet has been reduced to a minimum, or has continued with a wearying sameness for weeks, will always wish that all foods could always taste as rich and satisfying as that dish of baked sweet apples and cream, which was the first solid food allowed. I know of nothing which by judicious preparation may be made to go so far in the dietary of the sick or well, with so little expense, as the apple. Very sweet apples are not so useful as those containing a moderate amount of acids, and the fruit, when eaten raw, should be used in moderation; half ripe or green it contains so much vegetable fibre in place of water and sugar, that even cooked it is inferior. The universal demand for apples is a good proof of their excellence as an article of food, even if their percentage of actual nutriment is low.

The medicinal value of cider depends upon how much alcohol it contains, and if care be taken to prevent the acetic acid formation of vinegar, so that the sugar be entirely converted in fermentation, it may be made to contain as much as nine per cent, a very large amount, and the cider thereby becomes a dangerous foe to sobriety, if freely indulged in. The true value of cider is, of course, in being a liquid easily obtained, from which a most excellent vinegar can be prepared. The so-called acetic fermentation by which cider vinegar

is produced, differs somewhat from vinous fermentation in this: In the formation of alcohol, the wine ferment takes its oxygen from the sugar; in acetic fermentation the vinegar ferment takes its oxygen from the air. This microscopic organism is known as the *mycodema aceti*, and in the new commercial method for manufacturing vinegar on a large scale, assumes great importance. The process by which cider is converted into acetic acid is substantially this: The sugar of the apple juice is first changed to alcohol by the vinous ferment and carbonic acid set free; then if exposed to air, the vinegar ferment goes to work and converts the alcohol into acetic acid. Vinegar is a valuable addition to the dietary, from its manifold uses as a preservative and condiment with which we are all familiar. Medicinally it is much used in the form of dilute acetic acid; it is a useful and stimulating application to sprains and bruises, and an efficient application in the form of a gargle for inflamed throats. No better remedy can be found in an emergency for the common accident of getting unslacked lime or plastering into the eyes. A little water acidulated with vinegar from the table, has saved a good many eyes by speedily combining with the lime to form a harmless compound.

I fear I have already wearied your patience, without affording you any information of which you were not before possessed, and with a brief recapitulation I shall have done. Fruit may properly claim to be of value as food because it contains substances of direct benefit to the bodily tissues; because it has established its right to a place among vegetables which are known as anti-scorbutics, and because apart from its own direct action, it serves as a grateful and refreshing accompaniment to other foods, enabling us to keep the appetite stimulated by a healthful variation of the diet. Fruits are a part of the food of man, and when rightly used, are most wholesome. Good ripe fruit (over ripe is almost as bad as half ripe or green) in reasonable quantities, is an excellent addition to the diet of growing children. It is certain that if children be deprived of it, they will obtain it when, where, and of what quantity they can. In case of its unwholesomeness, the sooner it is cast out the better. Good fruit should form a part of every meal, or better, the lunch. The best time is in the morning, accompanied by a little bread and a glass of water; the most unseasonable time is after a hearty dinner, or late at night. Grapes, figs, peaches, cherries and oranges are the most digestible; plums, apples and pears less so, and melons

least of all. Sugars, acids and alkaline salts are furnished by them in varying proportions. The juicy fruits, like cherries, strawberries and apples, are of the greatest value to those people who are prone to acid secretions, and if the subjects of gout and rheumatism would increase their fruit diet, it would save them money expended for medicine.

Fruit preserving was once a household matter, now it is an extensive and profitable business. The attractive dried apples and other fruit exposed for sale in our large city groceries, are no doubt tempting to purchasers who can ill afford the more expensive canned goods. Fruits prepared in this way are especially valuable at seasons of the year when the fresh article can only with difficulty be procured. It is to be regretted that for purely speculative reasons, much of this fruit has been subjected to chemical treatment to make a "nice white fruit," the price rising in proportion to the degree of whiteness. "The use of the bleached fruit is not without risk," says the bulletin of the Iowa State Board of Health. The bleaching is done by exposing the green fruit to the fumes of burning sulphur in the evaporator, or often before the time of exposure, varying with the degree of whiteness desired.

Germany forbids the importation of American evaporated dried apples, unless accompanied by a chemist's certificate that they are free from injurious substances, usually zinc, derived from galvanized iron trays used to hold the fruit in the evaporator. The burning sulphur forms sulphurous acid, which in contact with the air and water, becomes sulphuric acid, or oil of vitriol, which readily acts upon all metals, even in very weak form. Bleaching always injures the fruit flavor. The quality, and even variety, of well known fruits, if unbleached, can often be told by the looks and taste, when cooked, but when bleached, those made from good and poor fruit all taste alike. The sale of dried fruits has materially suffered from the over-doing of the evaporator business in 1888. Stewed fruits are valuable, but are often objected to as causing acid fermentation and flatulence. This is because of the addition of cane sugar. It would be better, in the preparation of such fruits, to neutralize the acidity by the addition of an alkali like carbonate of soda, thus leaving its natural sweetness. Such stewed fruit ought to be a regular addition to the diet of those well advanced in years. Fruit has its uses in disease, but it is well always to remember that when one is sick, the digestive organs are more or less affected, and whatever is given as food

must be carefully selected. Suppose we have a patient with one of the diseases characterized by a sharp burning fever; the throat is dry, thirst is urgent. Now we can afford relief by frequent draughts of apple water, tamarind water, drinks made from the currant, raspberry, the lemon or lime. All sorts of preserved sub-acid fruits, grapes, or other easily masticated fruit, may be included in the diet.

Fruit both raw and cooked, lends valuable assistance in regulating functional disorders of the intestinal tract characterized by deficient secretion, a few figs daily, stewed prunes or apples with the other food will obviate the frequent recourse to pills or other drastics, the demand for which often grows with their use. Sometimes fruit will relieve an undue looseness of the bowels. A quantity of apples consumed peel and all has often checked a bilious diarrhoea. All vegetables and fruits which contain tannic acid or other astringents are useful in these affections. The juice of cranberries or the pomegranate and various other plums as well as the juice of cherries and the astringent wines are all valuable to aid in checking over action of the bowels. There is one disease in which almost everything that can be done must be accomplished by management of the diet, from which fruit fresh and preserved must be rigidly excluded, that is diabetes, characterized by an excess of sugar in the blood, hence everything which will contribute to the formation of sugar in the body must be avoided. The gouty and rheumatic, as has already been intimated, need acid fruits in large amount both raw and cooked.

Knowing what fruits contain, knowing what in their composition is appreciated by the body, the question assumes relatively the same position as that of preparing animal food for consumption. Nature is always ready to meet us half way and if we want fruit abounding in healthful properties, loaded with a maximum of useful sugars and acids and a minimum of hard, indigestible, useless vegetable fibre, let us feed the trees with those substances which are necessary for their nutrition and which will be returned to us in the form of the fruit. We shall then feel the satisfaction of having contributed to human food one of its most valuable, healthful and economical elements, and can heartily agree with that old writer who characterized fruit as "the most perfect union of the useful and beautiful that the earth has known."

THE DOMESTIC VALUE OF THE APPLE.

By Mrs. FLORENCE J. RICKER, Turner.

Long, long ago God placed two happy sinless beings in the Garden of Eden. Everything about them showed the handiwork of a Divine Being, from the tiniest flower to the abundance of delicious fruit. All this loveliness was to be theirs to enjoy with the exception of one tree, the fairest so it seemed to them of all, of which they were forbidden to partake. But the tempter came and said to the woman, "The fruit of this tree is fair to look upon and its aroma is as the nectar of the gods, so if you but eat of it you may, like them, know good and evil." Then the woman did eat and saw that it was good, and did offer to her husband and he did eat, and for this one disobedient act, they lost their beautiful home in the Garden of Eden and were banished to a life of toil, sorrow and suffering.

You ask, why do you tell that old story of the fall of man? Has it any connection to the present subject, "The Domestic Value of the Apple?"

This was the first family formed on earth, and here we find as believed by most persons, the apple to figure largely in their domestic happiness. It was not that the apple was inferior to other fruits that it is supposed to have been chosen as a test of their faithfulness to their Creator, but rather that it was the King of Fruits, so that the temptation being greater it would be a more perfect test whether they preferred to obey God or satisfy their own selfish desires.

We find accounts that apples were cultivated by the Romans and that they had a number of varieties; it is also believed that they introduced the apple into England. Pliny mentions twenty varieties. Early chronicles are silent as regards the propagation of the apple until after the establishment of Christianity when the monks and religious leaders planted orchards. In the time of Solomon we find Christ referred to by him, "As the apple tree among the trees of the wood, so is my beloved among the sons, I sat down under his shadow with great delight, and his fruit was sweet to my taste," showing how highly the apple was prized at that time.

The early settlers of America brought over the apple tree with them from England and planted many orchards, and from them the Indians started orchards throughout the country. One of these old

Indian orchards was in being not long since in the vicinity of Boston. All this time new varieties were being found and the apple was improving with culture. We therefore see that from the creation the apple has held a prominent place among fruits, through successive ages up to the present time when it is considered the most valuable fruit of all, and the one from which we would be the last to part.

Many will perhaps say, we beg leave to differ with you concerning that last statement. Are there not fruits more delicious than the common apple? Perhaps, yes, but do those same fruits last the year round always obtainable and within the bounds of the purse of nearly every one? Let us look at the comparative value of the apple and some of our other fruits in the market. Seldom do we ever have to pay more than one cent apiece and oftener less for the apple while oranges are from three to five cents apiece, bananas, ditto, and so on through all imported fruits, for we must pay the cost of transportation, therefore for the same money we can at least obtain twice the quantity of apples, that we can of other fruits. But you say, "we make up in quality what we lack in quantity in other fruits." This time I beg leave to differ with you. What is more delicious than the Sweet Bough, Porter, Gravenstein, Hubbardston Nonsuch, Fameuse, King Sweet, Russell, Munson Sweet, Deane, Nodhead and many others too numerous to mention? for we have such a variety in the apple itself that at any season, some kind may be found that would tempt the appetite of the most insatiable epicure. We all know that there is nothing better to promote good digestion, than a good apple eaten directly after a meal, and a baked sour apple is a luxury in which the invalid may indulge.

Another plea for other fruits for dessert is, the artistic taste that may be displayed by the arranging of many kinds of fruit together. Now, cannot there be as much beauty in the arranging of different varieties of apples if the same care be taken to put kinds together whose colors would harmonize as in the former case? I think too little pains is taken to select good perfect apples and kinds that are seasonable for the table at our hotels and restaurants, while on the other hand the imported fruits are displayed at the best possible advantage, thus giving the general public the idea of inferiority to the apple.

Having spoken of the apple as it comes to us fresh from the hand of nature, we will now turn to the culinary department. Here we find a wide field to exercise the taste of display, as well as to tempt the

appetite. What can be a more dainty and palatable dessert than the following, taken from the *Orchard and Garden*?

Pare, core and cook a dozen apples in a syrup made of a cupful of sugar and two of water. When they are tender lift them out and cover with a thin layer of beaten whites of eggs. Sift granulated sugar on this and let it brown slightly with the oven door open. Let the syrup boil away till it will be a firm jelly when cold. Cut it in squares and lay it on and about the apple. Serve with sugar and cream.

Another, equally as dainty, is "apple snow," served in the same manner. Then the sweet apple custards, sweet apple honey, bird's nest pudding, steamed pudding with apples in it, baked sweet and sour apples, steamed apples, baked Indian sweet apple pudding, Indian cake with sweet apples in it, the pickles, the jellies and the preserves. Oh, time would fail me to tell of the multitude of delicacies for the table that can be made by combining other ingredients with our common (or, shall I say, uncommon) apple. And then the dried apples, from which many turn away as of no value, are so nice in "steam puddings," "Marlborough pies," "farmers' fruit cake" and many other nice dishes for the table.

As this Society is composed almost entirely of male members, I will not weary them with an account of the manner that many of these nice dishes are prepared, but for the benefit of the ladies many recipes which I have gathered from various sources are printed in subsequent pages of the Transactions of the Society, so that there they can have the opportunity to read them, test them and place them before their "lords and masters" in an eatable form, who will then be able to pass judgment in a capacity best suited to their taste.

But we must bear in mind that not every variety of apple will make as nice a dish as one just suited for what we wish to use it. For instance, if we wish the apple to be soft when done, as in apple pie, we must choose a tart, juicy apple, and one that is just in its prime, not one that will be good two months hence; but if, on the other hand, we wish the form to be preserved, we better take a harder and not so acid an apple. A little care exercised in selecting fruit for cooking will often make a nice dish of what would otherwise be an unpalatable mystery.

Having endeavored to point out some of the numberless ways in which the apple is of use to us as house-keepers, perhaps it may

lead the orchardist to look well to his trees, that we may have the best fruit to use to make these tempting dishes, and in selling to remember if he leaves all the inferior fruit for home use, he need not flatter himself he will see these nice dishes on his own table, for it is true as regards fruit as it is in other things, inferior material will not make a first-class article. So, now, Mr. Pomologist, lend us your aid and approval and we will do all we can to tempt the appetite and gratify the eye by nice dishes prepared from the apple.

RECEIPTS FOR COOKING APPLES.

Compiled by Mrs. RICKER.

SWEET APPLE CUSTARD PIES. Stew and sift and use like pumpkin or squash in making a filling. Still nicer if frosted like lemon pies.

SWEET APPLE HONEY may be made from the juice of stewed sweet apples and sugar. Boil until it is thick like honey.

APPLE SNOW Pare and core tart, juicy apples; stew with just enough water to keep from burning; sweeten with white sugar; flavor with lemon, the juice is better than the extract; sift through a potato masher or beat it until light; eat with whipped cream.

No. 2. To the above when cold, add, for a dish large enough for eight to ten persons, the whites of two eggs; beat the mixture until it is stiff enough to stand alone and "white as snow," and serve with whipped cream. Fameuse apples or any white-pulped ones are good.

APPLE SNOW is nice to put between small squares of cake and for filling tart shells. Use any flavoring preferred.

BAKED APPLES. Take tart, even-sized apples, scoop a round piece out of each end, fill the upper end with sugar; bake with a little water. Serve with whipped cream and sugar.

APPLES BOILED with either sugar or molasses make a change in the routine of apple sauce, as also the following:

Select medium sized apples, wash them and pack into a stone pot as closely as possible, turn over them one cup of sugar and one-half cup of water to every three quarts of apples; let them cook about two hours in a moderate oven, and remain in the pot until cold.

Another way is to boil or steam apples until they are soft and then turn over them a syrup made of brown sugar.

APPLE FRITTERS. Make the batter as for plain fritters. Pare and core nice tart apples; cut them in thin slices, dip them in the batter and fry brown.

BIRD'S NEST PUDDING. Pare and core six large apples. Make a syrup of one quart of water and one cup of sugar, simmer the apples in this until they are tender, but not so tender but that they will keep their shape; lay them in a pudding dish, and cover with a custard made with one quart of milk, five eggs, and three spoonfuls of sugar. Bake until the custard is firm. May be eaten either cold or hot and without sauce.

APPLE FLOAT. Fill a deep glass dish half full of soft custard and then heap up with apple snow. (Make the custard with the yolks of the eggs).

APPLE DOWDY. Pare and quarter about one dozen good tart apples, put them in a kettle with one cup of molasses, a small piece of butter, and one pint of hot water. Set this on the fire, and let it come to a boil, and while it is heating make a paste with one pint of flour, one teaspoonful of cream tartar, one-half of saleratus, and a little milk; roll this large enough to fit into the kettle, and when the mixture begins to boil, put in the paste, cover tight, and boil gently twenty minutes. To be eaten without sauce.

APPLES ARE VERY NICE in sago and tapioca puddings also in steamed batter puddings.

FARMER'S FRUIT CAKE. Two cups dried apple, two cups of molasses, two eggs, one cup of butter, one teaspoonful each of cloves, cassia and nutmeg, three and a half cups of flour, one teaspoonful of soda. Soak the apples over night in cold water, then chop, put them in molasses and simmer slowly two hours, then mix the ingredients.

APPLES. Two pounds of apples pared and cored, sliced into a pan; add one pound sugar, the juice of three lemons, and grated rind of one. Let boil about two hours, turn into a mold. When cold serve with thick cream.

CIDER APPLE SAUCE. Boil cider away about one-third, then take three parts cider to two of dried, sweet apple. Put into a kettle and cook slowly two or three hours until the apple is soft.

APPLE GINGER. Allow four pounds of light brown sugar to four pounds of apples, weighed after paring and coring. Chop the apple fine with the juice and rind of three lemons. Add to the apple one ounce of white ginger root which can be bought at the druggists, and cook all together slowly three or four hours or until it looks clear. This will keep for years in a cool place, and is considered a very nice addition to the usual stock of preserves.

SWEET PICKLE. Pare and quarter sweet apples and boil them in clear water till they can be pierced with a fork but not until tender enough to break. Now make a syrup of one quart of vinegar and one pound of sugar, boil it and then put in the apples, which may have a whole clove stuck into each quarter; cook a few minutes, put in jars and seal closely. The syrup may be spiced if liked.

MARKET GARDENING.

By W. W. RAWSON of Arlington, Mass.

[Abstract of paper delivered before the State Fair Meeting.]

Market gardening should be distinguished from farming. While the market gardener is a tiller of the soil, his occupation differs essentially from that of the farmer.

By market gardening is meant the raising of such vegetables as celery, lettuce, cucumbers and the like, with a few of the more stable and hardy characters, such as squashes and beets.

The business of market gardening has within the last twenty years become one of considerable importance, and when understood is quite profitable. In this business, as in every other, the success depends more upon the man conducting it than upon anything else.

He must understand the nature of growing plants; the different qualities of soil required for each; the mode of cultivation and the time of planting best adapted to the climate where located. He must have some knowledge of chemistry and botany, must be a practical engineer and mechanic, and also be familiar with the laws of nature. After these requirements, the more common sense he has, the better for him.

The location of the garden is quite important. It should be as near the market as possible. If the roads to and from the market are level, the land will be much more valuable, because one of the

largest items of expense in connection with the business is the teaming of the product, and the manure necessary to secure a crop.

The land should be of various qualities, and a gentle slope to the south and west is much preferable, because on it the crop will mature earlier, and it is easier to irrigate it. Nearness to a river or pond would be advantageous, because from it a supply of water could be obtained. If not near a river or pond, then a well could be driven which would answer the purpose. The possession of these would add value to the place. Ten acres well irrigated are worth more than twenty acres without irrigation.

The use of glass has also become very important in connection with growing crops of this kind, and many of the largest crops are grown almost entirely under glass. Hot-houses and hot-beds are used. The heat in the former must be furnished in cold weather by steam or hot water, in the latter by hot manure.

The man who undertakes this business must serve an apprenticeship of several years, in order to become familiar enough with it to enable him to carry on a market garden, either for himself or for any one else, successfully.

I have had many come to me and say that they would like to work for me a year, that they might become familiar with the business, or, in other words, learn the trade.

I have told them that that would not be long enough time, and that five or six years would be little enough.

There is no class of men at the present time for which there is so much demand as for market gardeners, and at better wages than they could command in any mechanical or professional pursuit, with the same time spent in fitting themselves for their calling. It is a very healthy business. There is a great variety in it, and something is constantly coming up that is new, and which will demand study and earnest attention.

I have followed it for twenty-five years, and have been unusually successful; yet I feel that I have many things to learn, and that the business is at present but in its infancy.

It is but a few years since hot-beds were introduced, and but ten years since hot-houses were first used. They were first heated by hot water, and later steam was used. Then it was learned that irrigation would be a great benefit; and now the electric light is coming into use. I believe that it has not only come, but that it has come to stay, because of the very great benefit it will be in

the growing of our kind of crops during the short days of winter. It will be a very profitable investment to all who will use it. I have one large light of 2,000 candle-power over one of my houses, and ten 30 candle-power inside another house. The effect has been very manifest, and the result of the experiment very satisfactory to me. I could see the effect upon the growing crop very soon after the lights had been placed in the houses.

I think I prefer to have them all inside the houses, and placed about twenty-five feet apart in a house twenty-four feet wide; the house would then be almost as light as day. The great objection to a light outside is that in frosty weather the light could not shine through the frosted glass, and it would therefore be of but little benefit, but when placed inside it has all the chance possible.

I cannot tell at present just how much benefit the light is, but by another year I shall have had it thoroughly tested.

The market gardener has many difficult problems to solve and but very few things in his favor. The weather is quite an important factor; but this is uncontrollable and we cannot find a substitute or a remedy. First-class help is hard to find; good land is difficult to obtain, all of it being occupied; the South is competing very closely with us; it is a constant struggle from beginning to end, and from morning to night. Unless the market gardener is in love with his business, it will be very discouraging.

In market gardening, as in every other branch of business, if one would carry it on successfully he must have special men for special work, and this can only be done by one who does sufficient business to enable him to employ a head for each department. In a mercantile establishment each member of the concern has a special part of the work to perform, and devotes himself to it exclusively. Each department has a head, who is held responsible for its success.

In mechanical establishments the same plan is adopted and the same responsibility is placed. In the professions we find that individuals are applying themselves to specialties. It must be so if success is to be achieved. In carrying on a market garden, I say employ a superintendent, a salesman, a green-houseman, a foreman for each department; a night-man to attend the fires in winter, and to keep an eye on the whole place; a machinist to look after the machinery and tools; a painter to keep wood-work from going to decay and to keep the glass in repair; a hostler to take special care of the horses; a harness-maker to look after the harnesses

and to keep them in repair and to keep the horses from having sore shoulders in summer, etc.; a man to put up or to see to the putting up of all the vegetables that are going to market, so that they may always be put up uniformly and in a salable condition, so that your first and second qualities may run always the same, and the trade may know what to depend upon. Always select for a driver of the teams one who is adapted to it, so that the most may be obtained from the horses with the least wear upon them.

The selling of goods is not so difficult as in former years. Large quantities are now sold where but a little was sold a few years ago. The market gardener near a large city can dispose of large quantities of vegetables of many kinds if the quality is first-class.

Sometimes the prices realized are quite small, but where they are raised in large quantities the cost is much less than it was twenty years ago.

The sales are all for cash, and in this respect it is one of the best kinds of business carried on. If the market gardener has a load for market every day, there is money constantly coming in, and he has ready money to pay his bills after he once gets started.

The cultivation of the soil is a very important matter to be understood. It requires much experience to know when to plant and how to plant. The selection of seed is also a very important matter. Success in this direction can only be obtained by carefully looking ahead, and by making the selections in the early part of the winter. You must know just how much is wanted; but always buy enough.

Before I went into the seed business I bought a great many seeds. My plan was to go to some reliable dealer, and tell him just what I wanted. I asked for the best and always paid the highest price, so I was reasonably sure of getting the best. I fared much better than if I had spent my time looking around to find where I could buy the cheapest. You will find that, if you will always look for the best, the best will always be looking for you, and the man with whom you deal will, if he has something extra nice and knows that you want it, send you word or save it for you. Follow this rule in relation to seeds, and you will find that you will come out a long ways ahead. I have bought as high as \$1,000 worth of seeds in one year, and I have never been cheated by a seedsman. I have paid the highest price and have felt that I have received my money's

worth. The tools upon the market garden should be the best and of the most approved pattern. They should be kept in perfect order and in a building expressly for the purpose.

A plan of the place should be marked out early in the winter, and it should be definitely settled what crop is to be put into each piece the following season. This will enable you to get the manure into position—the different kinds for the different crops. Estimate the quantity of seeds required by the size of the piece to be planted. Look the tools over carefully and have them put in the best of order. Do everything that can be done before the ground opens.

With the work all planned, the seed bought, the manure in place and the tools all ready, you can go to work, and in the busy time of planting you will appreciate all that has been done in the winter, you will be able to keep up with the work, and you will see how important it is to get everything ready, as I have described.

I would therefore advise young men who are thinking of taking up the market gardening business, to carefully study the requirements and then fit themselves to fill them. By following the suggestions I have offered they will be fitted to carry on the business with satisfaction and profit. Some may ask: How can the necessary education be obtained? I would say to them: Complete your grammar school course, spend one or two years in a commercial college, go to the Agricultural College, and after that course is completed, spend one year in the Experiment Station. Then engage yourself to the best market gardener you know of who will take you for three or five years. Then you will be fitted to take a position as a foreman, or you can carry on the business for yourself.

Some may ask: Are there any positions for young men with the education you have described? I will say that there are, and I have some waiting to be filled at the present time, and can find no one to take them. There is a good salary waiting the position for the right man. This business is in the advance line of agriculture. It has never been brought to the notice of agriculturists as it should have been, but it is now, or soon will be, in the front, even though it is but in its infancy. It is that kind of a business that requires special training and a practical knowledge to secure satisfactory results. The amount of capital required is quite large, but not more so than is necessary in other lines of business carried on at the present time.

The profits, if carried on on a small scale, will not be so great as if carried on on a large scale, and they are not so great as a few years ago.

By starting small, giving close attention, and keeping the business on a pace with the times, the capital will be readily obtained. Only those will succeed in any business who attend to it, and as we learn in the Scripture, "only those who endure to the end shall be saved."

SOME FUNGOUS DISEASES OF FRUITS.

By Prof. F. L. HARVEY of the State College.

The depredators upon fruits and fruit trees are not confined to the insect world. There is a host of minute plants, known by the general name of fungi, that are parasitic upon higher plants and derive their nourishment from them. The rusts, smuts, bunts, rots, scabs, moulds, mildews, blackknots and blights, so common on our fruits or farm crops, are all parasitic fungi. The parasitic fungi are mostly minute organisms, and have to be studied by the aid of the compound microscope. This is why they are so difficult to observe, and why so little is generally known about them by fruit growers. It is a difficult undertaking to wage war against minute organisms, so small, that the compound microscope is necessary to see them. The study of these parasites must largely be turned over to specialists, who have the time and apparatus to investigate them. The study of parasitic fungi is now claiming the attention of many good botanists in this country, and we may hope for a better knowledge of them. The last few years has added much to our knowledge of these pests and their treatment. A few words about fungi in general, and their relation to higher plants, may prove interesting and instructive.

Upon the method of reproduction, botanists divide the vegetable kingdom into two great groups: phænogams and cryptogams. The former reproduce their kind by means of seeds, which are the product of true flowers. These seeds contain a little plant, more or less formed, which under proper conditions of moisture, warmth and oxygen develops directly into a plant like the parent. The plant body is generally large in proportion to the flowers. Though some

are parasitic; as the dodder, some orchids, the mistletoe of the south and others; the most are provided with chlorophyll, the green coloring matter of plants, and capable of elaborating their own living. They are frequently called the higher plants and are believed, as a class, to have been the last introduced upon the earth. Most of the plants we cultivate for their fruits, roots and seeds belong to this group. In fact most of the useful plants of the world are flowering plants.

The cryptogams or flowerless plants produce neither flowers nor seeds, but are perpetuated by minute simple cellular organisms called spores. Some fungi produce several kinds of spores, each capable of reproducing the species. The spores of most fungi develop into the parent form directly, but in many flowerless plants, there are one or more intermediate growths or generations. The real plant among fungi is so small, that it is not usually noticed, especially when it is parasite and internal. The plant body of fungi is usually composed of small, white, slender threads. These ramify through the host plant, or the decaying matter on which the fungus feeds. In other forms the parasite spreads over the surface of the host. The reproductive organs being so much larger, they are the parts that generally attract attention. The white slender threads, that compose the real plant, are collectively called the MYCELIUM. The fungi that get their nourishment from decaying or dead organic matter, are called SAPROPHYTES, (Corpse-plants). They are the scavengers of the vegetable world, hastening the decay of organic matter, and converting it into food for higher plants. They serve a good purpose, and cannot be classed as injurious fungi, only as they attack wood used for fuel and timber, or hasten the death of weak or diseased fruit or shade trees. There is another class of fungi which live on the inside or outside of living plants and derive their nourishment from them. These are called PARASITES. They are the tramps, paupers, and robbers of the vegetable world. They have no chlorophyll in their structure and therefore no ability to make their own living. They have the voracity of tramps, the dependence of paupers and the audacity and pertinacity of robbers. They seize their victims with relentless grasp, sapping their life juices, producing weakness or decay. This is the class of fungi that damage our fruits and fruit trees. There is another class of fungi that are saprophytic in some stages of their growth and parasitic in others. These may be injurious.

Fungi may be perennial, that is, the mycelium may live from year to year. When this is the case the continuance of the species from

year to year does not necessarily depend upon the spores. This is the case with apple scab and others. Many fungi produce profusely, during the summer months, what are called *summer spores*. These spores rapidly multiply the pest. It is largely to the summer generations that the damage is due. In the fall, winter, or resting spores may be formed to perpetuate the species. Fungi have their likes and dislikes. They usually select their particular host plants, though a fungus will often infest a number of plants botanically related, or infest in different stages, plants not at all related. We feel inclined to ask the question, whether fungi serve any good purpose, or are they only thorns in the flesh of man? The saprophytes certainly hasten the decay of matter, and prepare food for the higher plants. The parasites, in nature, serve to hold vegetation in check and preserve the equilibrium. Man is the disturbing force. By bringing the wild plants into a high state of cultivation he has made their tissues softer, and more inviting to parasites, and he must cheerfully and patiently adopt measures to restore the balance of forces he has disturbed. This can only be done by a careful study of the nature of fungi, and the enforcement of a rigid warfare against them. They must be regarded as our eternal enemies and kept in subjection by constant watchfulness. Many a fruit grower can trace the destruction of his orchard or vineyard, by a parasite, to not taking trouble to stamp out the pest when it first appeared. The Horticulturist should be watchful, detect the first appearance of parasites and act promptly before it is too late. There are some fungi that cannot be eradicated, but require constant treatment to keep them in bounds. The application of fungicides and insecticides has become as necessary for successful fruit culture as tillage and fertilization. This is to be regretted but must be endured. We must put our armor on, and keep it on, and always be ready for the fight. Vigilance is the price of fine fruit now days, and the prize is to the vigilant. The fruit business is profitable, and if fruit could be produced with no trouble the business would be over-crowded. Insects and fungi are nature's regulators. They develop patience and industry in man, drive out the lazy, and leave the vocation to the few workers. In spite of drawbacks fruit growing in Maine pays well. We heard it remarked the other day, that the prosperous farmers of Maine are large orchard owners. To intelligently cope with fungi we must know their natures, their lives, their weaknesses, their strongholds. There are helpful and useless methods of

dealing with parasites. Successful methods must be based upon a general knowledge of fungi, and a familiarity with the life changes of the one in hand.

The following rules, based upon the general nature of fungi, may aid somewhat in checking, avoiding, or destroying these pests:

1. If the parasite is established and lives within the host, remedies are generally useless.

2. If the parasite is external, spraying with a suitable fungicide is often helpful, but sometimes the fungus will resist the action of poisons as well, or better than the host.

3. If a plant is hopelessly infested and liable to spread the disease to healthy plants, it should *without delay* be burned, root and branch.

4. Apply protective fungicides, to prevent the germination of spores that fall upon plants. This is a preventive measure of great promise. It would destroy summer spores, the greatest source of infection, before they have a chance to grow. Copper compounds are coming largely into use. They destroy the spores which are so rapidly formed during the summer months.

5. Spray plants affected with a perennial fungus, during the season of spore formation, to prevent the disease spreading to the fruit and leaves and to other trees.

6. When only portions of a plant are infested, use the knife at once. Burn the diseased part. Do not throw it on the ground.

7. Burn all refuse from crops in the fall, which may contain resting spores and perpetuate the disease over winter. Don't leave rotten apples on the ground, or spread refuse from diseased apples in the orchard.

8. Destroy any wild plants or weeds, growing in the vicinity of crops, that harbor injurious fungi.

9. Keep plants in health by proper fertilization. An impoverished or weak plant, like an animal lacking vigor, is an easy prey to disease.

10. Special fertilization, that is, the introduction into plants of substances not harmful to their growth, but prejudicial to fungi. This is problematical, though perhaps possible.

The above principles are more or less applicable in the treatment of fungi, but the life history of a particular fungus must be known before a specific treatment can be adopted. Below we give a list of a few common fungi that affect large and small fruits.

In this paper only a few of the fungi of large fruits are considered, and these, for a want of time and space, have not received a detailed consideration.

A Few Common Fungi Injurious to Fruits.

Large Fruits	{ Apple.....	{ Scab or Black Spot— <i>Fusicladium dendriticum</i> , (Wallr.) Fekl. Powdery Mildew— <i>Podosphaera oxycanthæ</i> , (D. C.) DeBy. Bitter Rot— <i>Gloeosporium versicolor</i> , B. & C. Rust— <i>Rostelia</i> species. Pear Blight— <i>Micrococcus amylovorus</i> , Bur. Pear Leaf Blight— <i>Entomosporium maculatum</i> , Lev. Black Knot or Plum Wart— <i>Plowrightia morbosa</i> , Sacc. Rot— <i>Monilia fructigena</i> , Pers. Leaf Spot— <i>Septoria cerasini</i> , Pk.
	{ Pear	
	{ Plum	
	{ Cherry	
	{ Blackberries	{ Anthracnose— <i>Gloeosporium venetum</i> , Anthracnose— <i>Gloeosporium venetum</i> , Powdery Mildew— <i>Sphaerotheca mors-uvæ</i> , Leaf Blight.
	{ Raspberries	
	{ Gooseberries	
	{ Currants	
	{ Strawberries	{ Leaf Blight, Rust— <i>Ramularia Tulasnei</i> , Sacc.
		{ Leaf Blight— <i>Sphaerella Fragariae</i> , Downy Mildew— <i>Peronospora viticola</i> , Powdery Mildew— <i>Uncinula ampelopsidis</i> , Anthracnose— <i>Phaceloma ampelinum</i> , DeBy.
	{ Grapes	{ Black Rot— <i>Loestadia Bidwellii</i> , Sacc. Bitter Rot. White Rot.
Small Fruits		

RECIPES.

The following recipes, taken from the United States Agricultural Reports, will be referred to in this paper, and for convenience of reference are given here. They have all been tried and have stood the test of application. The one selected will depend upon the disease and the material at command.

(1) SULPHATE OF COPPER SOLUTION.

Dissolve one pound of pure sulphate of copper in twenty-five gallons of water. Should not be applied to tender foliage. Can be used before the leaves start. Can be easily prepared.

(2) BORDEAUX MIXTURE.

(a) Dissolve sixteen pounds of sulphate of copper in twenty-two gallons of water; in another vessel slake thirty pounds of lime in six gallons of water. When the latter mixture has cooled, pour it slowly into the copper solution, taking care to mix the fluids thoroughly by constant stirring.

(b) Dissolve six pounds of sulphate of copper in sixteen gallons of water, and slake four pounds of fresh lime in six gallons of water. When cool, mix the solutions as described above.

This formula requires *fresh* lime. Air-slaked lime, or a paste made by allowing freshly slacked lime to settle, contains a large percentage of water; consequently, if they should be combined in the proportions indicated, there would not be sufficient lime to decompose the copper. Experience has shown that while four or even three pounds of fresh lime is sufficient to decompose six pounds of copper sulphate, it requires double that quantity of air-slaked lime and three times the amount of paste.

The manner of preparing the Bordeaux mixture may be modified in various ways. Colonel Pearson pulverizes the sulphate of copper, and then dissolves it in from two to four gallons of hot water. The lime is then slaked in the same way that masons slake it for mortar. This is strained into a box, left to settle and thicken, and then combined with the copper, adding water to the required amount.

(3) SOLUTION OF AMMONIACAL CARBONATE OF COPPER.

Into a vessel having a capacity of about one gallon, pour one quart of ammonia (strength 22° Baumé), add three ounces of car-

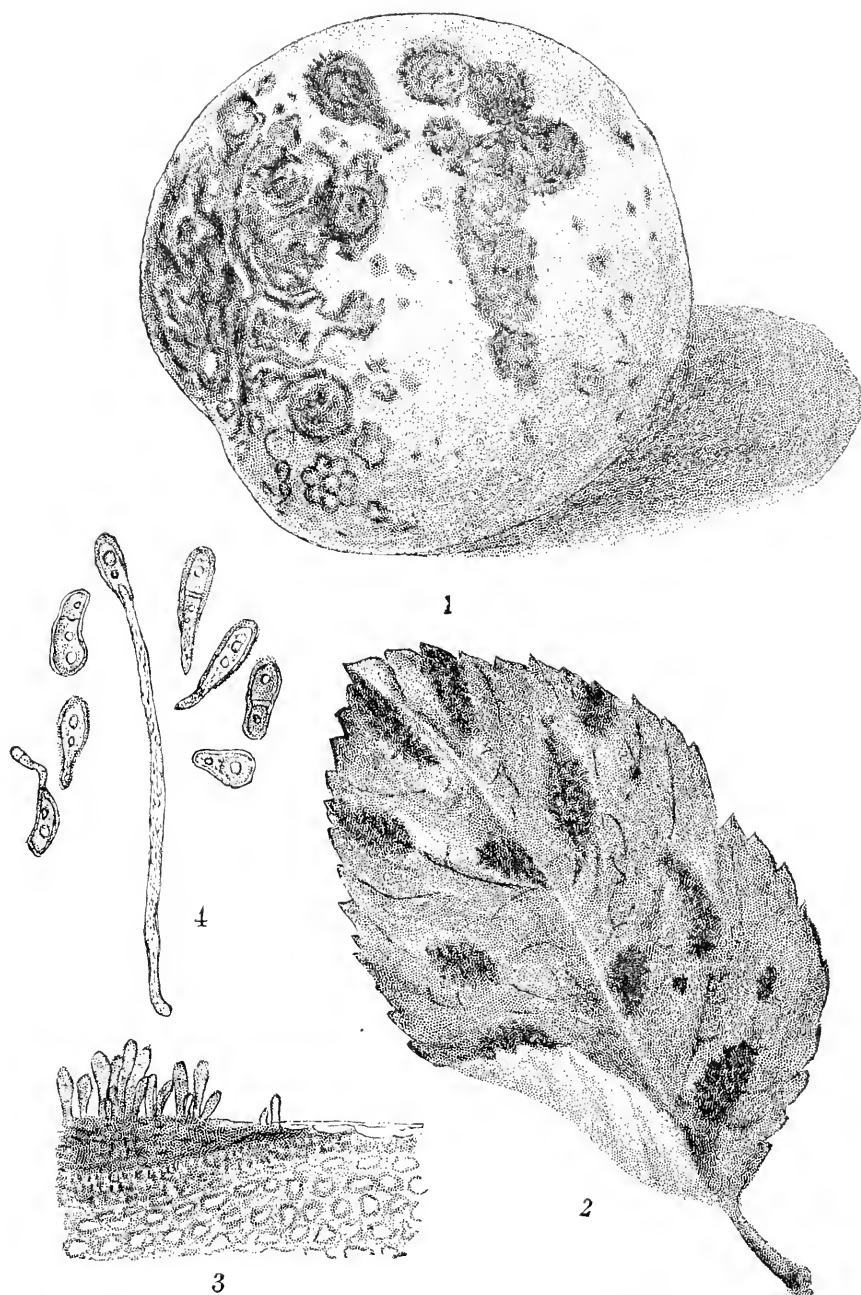
bonate of copper, stir rapidly for a moment, and the carbonate of copper will dissolve in the ammonia, forming a very clear liquid. For use, dilute to twenty-two gallons.

(4) EAU CELESTE.

(a) Dissolve one pound of sulphate of copper in two gallons of hot water; when completely dissolved, and the water has cooled, add one and a half pints of commercial ammonia (strength 22° Baumé), when ready to use dilute to twenty-two gallons.

(b) Dissolve two pounds of sulphate of copper in two gallons of hot water; in another vessel dissolve two and a half pounds of carbonate of soda; mix the two solutions, and when all chemical reaction has ceased add one and a half pints of ammonia, then dilute to twenty-two gallons.

The strength of the above solutions can be modified by adding more or less water, and arsenical compounds may be added to destroy insects.



APPLE SCAB [*Fusicladium dendriticum*]. This plate was drawn in crayon stipple by Miss Hannah Lord, Orono, Me., from the colored plate by George Marx (U. S. Agr. Rept., 1887, Pl. II). Fig. 1. Apple showing the scab. Fig. 2. Apple leaf showing the scab. Fig. 3. Section through a portion of a scab spot on the fruit, showing the growth of the fungus, greatly magnified. Fig. 4. Spores of the fungus greatly magnified, four of them germinating.

APPLE SCAB OR BLACK SPOT—*FUJISCLADIUM DENDRITICUM*.

Attention has been called to this fungus parasite as doing considerable damage to apples in the State. Apples marketed in Orono and Bangor have been examined and the disease found to be common in this region. We also learn that it is prevalent in other portions of the State. The disease is widespread over the country, destroying in some of the states annually from one-half to one-sixth of the crop.

This fungus attacks the twigs, buds, leaves and fruits, but is most noticeable on the fruit, appearing as olive green spots, with a circular outline, which become velvety as they get older. When the fungus attacks the twigs and leaves it affects the vitality of the tree. The greatest injury is done to the fruit, the marketable product. An early attack causes the fruit to shrivel and drop—a later attack produces a withered stunted growth. A late attack upon the full grown fruit discolours its surface and depreciates its marketable value, making it liable to rot under the scab spots when stored. The disease is worse in damp, cold seasons. It starts in the spring from spores that have lived over winter, or from the plant body, which has retained its vitality in the twigs, fruit or fallen leaves. The cold, damp, spring weather causes a rapid growth of spores, which establish themselves upon the young fruit and leaves. The warm, dry, summer weather arrests the growth, which is continued again during the damp, cooler, autumn months. The fungus shows some preference for certain varieties, but in bad seasons all are more or less affected. The parasite has a wonderful vitality and the plant body is probably perennial. We have now, January, apples covered with the fungus in a vigorous growing condition. Specimens apparently dead when taken from the barrel, kept moist a few days, begin growth. It has been shown that the spores will germinate in about eight hours at the low temperature of 50° F., insuring an early start in the spring.

The successful treatment of this disease may be regarded as an open question, but on account of the annual injury done it should be carefully studied. The station will conduct some experiments next season upon this disease and will be pleased to correspond with orchardists in different parts of the State where the disease was bad the past season, and coöperate with them.

The life history of this fungus would suggest the application of some chemical, by the spraying pump, early in the spring before the leaves start, to kill the spores as formed, and prevent them attacking the young fruit and leaves.

Mr. Goff of the New York Experiment Station has tried spraying the trees early in the season with a solution of one pound of hypsulphite of soda to ten gallons of water with encouraging results.

Prof. Scribner suggests for trial the following treatment:

(1) Spray the trees early in the spring, before the buds start, with a solution made from one pound iron sulphate (copperas) and one gallon of water.

(2) After the fruit sets, spray again with Bordeaux mixture prepared by dissolving sixteen pounds copper sulphate (blue stone) in twenty-two gallons of water. In another vessel mix thirty pounds of lime with six gallons of water. After the latter cools, pour the two preparations together and thoroughly mix them. It is best to prepare this mixture several days before it is needed, and stir it well before applying it. If the season is cold and damp, a second application should be made, later in the season. The spraying pump used to apply copper solutions should be made with copper or brass fittings.

To determine whether the spraying does good, the application should be made only to alternate trees in the row, or to one side of each tree. The effects upon the trees can thus be readily compared

RECENT INVESTIGATIONS.

The Department of Agriculture at Washington tried many experiments on fungicides the last season, to be considered in Prof. Galloway's report, which promises to be of unusual interest. Prof. Galloway has kindly sent us advance sheets of his Report from which we condense the following:

The past season experiments upon apple scab were conducted, under the auspices of the United States Agricultural Department, in Michigan and Wisconsin by Professors Taft and Goff. They experimented with various chemical compounds as shown in the table below, but the copper compounds were so much superior, they alone deserve consideration. It is recommended to spray as soon as the buds begin to swell. They sprayed seven times during the season, but think four or five times in ordinary seasons would be

enough. The last application was made about August 10th. The following copper solutions are recommended :

1. Dissolve, in a wooden vessel, three ounces of carbonate of copper in one quart of ammonia water 20° and dilute with water to thirty-two gallons.

2. Dissolve two pounds copper sulphate in hot water, and in another vessel dissolve one and one-half pounds bicarbonate of soda ; mix the two, and when cool add one and one-half pounds ammonia water 20°. Dilute to thirty-two gallons with water before using.

REMARKS.

The ammonia of commerce varies in strength. Usually that kept at drug stores is either 20° Baumé or 26° Baumé. If the former is purchased then follow the above recipes, but if 26° strong is used then add one-third more water.

DIRECTIONS FOR SPRAYING.

The first application should be made when the buds begin to swell, or as soon thereafter as possible. Apply the ammoniacal carbonate of copper solution with any good force pump, one to three gallons to the tree, according to size, being careful to cover the branches evenly and thoroughly. The Nixon nozzle is the best for this work, though any nozzle that will give an even, fine spray, will do.

The second application should be made when the apples are about the size of peas or larger, and if it is desired to spray for codling moths at the same time without extra labor, add one ounce of London purple to every twelve and one-half gallons of the ammoniacal carbonate of copper solution, and apply as stated above. A third application should be made two or three weeks later, and a fourth about August 1st to 10th. The cost of material for four applications need not exceed ten cents per tree. The copper carbonate, in twenty-pound lots, can be purchased from Eimer & Amend, 205-11 Third Avenue, New York, for fifty cents per pound, and ammonia by the carboy, eighty pounds, twenty-six degrees strength, for nine cents per pound. The material could be ordered direct, or through a local druggist, at a small advance in price. The labor required will vary with the kind of spraying apparatus used: ten minutes to the tree with a small pump, while with a larger pump the time could be reduced to five minutes. For a large orchard it pays to buy the best apparatus. Below is given a table showing the results of experiments conducted by Profs. Goff and Taft in 1889.

Table—*Showing Results of Experiments.*

		Prof. Goff's Experiments.					Prof. Taft's Experiments.				
		Applications	Free from scab—per cent.	Slightly scabby—per cent.	Badly scabby—per cent.	Cost per tree—cents.	Applications	Free from scab—per cent.	Slightly scabby—per cent.	Badly scabby—per cent.	Total yield—pounds.
Potassium Sulphide.....	7	30.04	48.55	21.41	37	7	25.5	74.3	.2	39	1,615½
Sodium Hyposulphite	7	43.24	42.78	13.98	29	7	23.6	75.4	.89	23	1,648
Sulphur Powder	7	32.72	54.31	12.97	31	7	17.6	81.2	1.1	31	1,435½
Am'l Copper Carbonate ...	7	75.02	23.35	1.63	38	7	51.2	48.6	.16	49	2,112½
Eau Celeste	-	-	-	-	-	7	68.8	31.0	.2	60	1,675½
Sulphur Solution	3	42.9	48.99	8.11							
Unsprayed	-	23.34	53.89	22.71	-	-	12.5	85.7	1.8	-	769½

DEDUCTIONS.

The ammoniacal copper carbonate gave excellent results, though all the solutions proved beneficial. The yield in pounds was increased by all, but most by the copper compounds. The greatest difference between the perfect fruit on sprayed and unsprayed trees (Prof. Goff's experiments) was 51.68 per cent, and the least 6.7 per cent. In Prof. Taft's experiments the greatest difference was 56.3 per cent, the least 5.1 per cent. The results were practically the same. The yield was nearly three times as great where copper compounds were used as on the unsprayed trees.

APPLE POWDERY MILDEW—*PODOSPHERA ONYCANTHE*. (D. C.) DeBy.

This is a minute fungus which spreads itself over the surface of the plant and by means of suckers, sent into the cells of the leaves or stems of the host, obtains its nourishment. It covers the plant with a powdery, meal-like growth, hence the name. During the summer the greyish, cobweb-like threads extend themselves over the plant and throw out powdery tufts, composed of chains of oblong bodies, the summer spores (conidia). These drop and spread the

disease. These summer spores may live over winter under some conditions, but the plant also develops winter spores (ascisporos) in sacs called perithecia. This disease has been quite troublesome to nursery stock in some parts of the country. It also is known to affect the plum, peach, cherry, sugar pear and other related plants. It is particularly bad on small trees in the nursery. The disease occurs sparingly in Maine.

REMEDIES.

Prof. Galloway has tried spraying the trees in the nursery row, with a solution of six ounces carbonate of copper and one-half gallon of ammonia water in twenty-two gallons of water. The cost for material and labor of applying it did not exceed two cents for 1000 trees. The results were satisfactory.

BITTER-ROT OF APPLES—GLEOSPORIUM VERSICOLOR, B. & C.

This disease is widely distributed, having been reported from many states. It seems to be worse in the southwest. We have found it somewhat common in Maine. The disease first appears as small, more or less circular, brownish, or blackish spots. These run together rapidly and finally involve the whole fruit. As the disease progresses it involves the whole interior of the fruit, which turns brown. The disease may develop after the fruit is stored, and spread rapidly from apple to apple. The mycelium, or plant body, is composed of threads that extend through the fruit. On the diseased spots are darker portions composed of slightly raised black points, sometimes grouped in clusters, or arranged in circles. These black specks are the external appearance of the organs of reproduction. They have small holes at the top, leading to receptacles, which contain the spores. The fungus lives over winter in decayed fruit.

REMEDIES.

Destroy all rotten apples. Do not throw them on the ground. Be careful not to store any apples showing the disease, as it will spread to the healthy fruit.

Sort apples frequently during the winter and remove any that show even the least evidence of the disease.

Spraying, with a solution of sulphuret of potassium, has been tried and promises well. It is probable that the copper compounds used for apple scab would also hold in check this fungus.

APPLE RUST—*ROSTELIA* SPECIES.

The apple rust is quite common in the Middle and Western states. This fungus in one of its stages of development causes, on cedar trees, what are called "cedar apples." The spores from the cedar apples fall on apple trees, germinate, enter the leaves and sometimes the fruit. It lives within the tissues of the host, finally appearing at the surface when the spores are produced. The *Rostelias* are generally believed not to survive the winter without the cedar apple stage, but there seems good reason for thinking that in some cases the *rostelia* stage may be perennial. We have not seen the rust on apples in Maine. But cedar apples are found, and *Rostelia aurantiaca*, occurs on the sugar pear. Destroying cedars near the orchard, and spraying with a copper solution, just before the cedar apples drop their spores, have been advised. The disease is of but little importance to Maine growers at present.

PEAR BLIGHT—APPLE BLIGHT—*MICROCOCCUS AMYLOVORUS*, BURRILL.

By the researches of Profs. Burrill and Arthur this disease is now known to be due to the species of bacteria named above. The parasite is always present in actively blighting tissue and by inoculating healthy branches with the organism the disease has been transferred. In the East the disease is mostly confined to the pear, but in the West, Minnesota, Wisconsin, Michigan and Iowa it is as bad on the apple as on the pear in the East. The disease is believed to retain its vitality in dead organic matter outside of the tree and the minute organisms are carried to the trees by the wind. They find entrance through the tender growing twigs, blossoms, or through injuries in the bark caused by sun scald, cold, or mechanical injuries. The parasite feeds upon the starch of the twigs causing an exudation of gum and liberation of carbon dioxide. When attacked, the tree appears as though fire had scorched the twigs and leaves of the new growth. Hot, wet seasons, especially a series of them, favor the disease. Dark porous soils are said to be favorable to the blight. Cultivation, by prolonging the period of growth, is said to favor the disease. If length of season increases the disease, why is it worse in apples westward and northward? If excess of moisture favors the plant, why is it worse on apples in the drier western climate? We hope the pest will continue its preference for western apples. We have received a number of complaints of its attacks on pears but none on apples in Maine.

REMEDIES.

The parasite works inside the bark and is beyond the reach of external applications. Being perpetuated outside the tree in organic matter, the entire removal of the cause is impossible. The following remedies, though helpful, can not be wholly satisfactory:

1. Cut and burn the blighted twigs.
2. Keep the ground under the trees free from decaying organic matter.
3. Do not cultivate, or till early. This will shorten the period of growth and insure the early formation of a dense bark.
4. Plant on soil; light colored, deep, and porous, and not liable to become overheated.
5. Plant buckwheat, clover or grass, to shade the ground and keep it cool. This growth would probably prevent the germs formed in organic matter on the ground, being carried to the trees.
6. Protect the trunks from sun scalds by low heads and inclining the trees to the southwest.
7. Avoid injuries to the trees.
8. Plant varieties least subject to blight.

PEAR LEAF-BLIGHT—*ENTOMOSPORIUM MACULATUM*, LEV.

This disease is so bad in some localities, that nurserymen have abandoned raising pear seedlings on account of it. It is due to a minute fungus which is composed of small colorless threads, that grow between and through the cells of the leaves destroying them and feeding upon their substance. The fungus first appears as small more or less circular brownish spots which soon run together causing the whole leaf to turn brown and drop. While the leaves still hang, a close examination will reveal numerous small black specks on the brown patches. These are the reproductive bodies of the fungus. These contain the spores, which are liberated by the rupturing of the epidermis of the leaf. Under favorable conditions of heat and moisture, the spores grow and bore their way into the tissues of other leaves. Spores formed in the fall live over winter in the fallen leaves and perpetuate the disease.

REMEDIES.

Prof. Galloway has tried spraying pear seedlings in the row with Bordeaux mixture, prepared as follows:

Six pounds of sulphate of copper was crushed and dissolved in ten gallons of water; four pounds of fresh lime was then slaked in six gallons of water in another vessel. When the solutions were cool, they were put into a barrel and thoroughly mixed.

The mixture can be applied with a Japy, or Eureka pump and the improved Vermorel lance and nozzle, or any other suitable spraying apparatus.

THE BLACK-KNOT OR PLUM-WART—*PLOWRIGHTIA MORBOSA*, SACC.

This fungus was described over sixty years ago by the noted botanist, Dr. Schweinitz. The nature of the fungus was quite well known at that time, at least the appearance of the excrescences and the cause of them was recognized. The nature of the reproductive organs, the conidia, stylospores, ascospores and pyrenidio-spores were made known by Dr. Farlow, but how these spores produce new knots has never been observed. From analogy it is thought the spores are carried by the wind, and, lodging on the branches, germinate and find entrance. There is need of careful study of the early stages of the knots and the means of infection. The fungus is probably perennial and not dependent upon the spores. The mycelium lives in the wood over winter and extends the knot the next season. The spores that find entrance develop into knots the next season. The summer spores begin to be formed in the spring, and continue to appear during the summer. The winter spores are ripe by February. The disease affects the plum, morello cherry and some of our wild cherries. The disease is confined to America, not occurring in Europe. In this country it has, with the curculio, about caused plum raising to be abandoned.

To devise means of destroying this fungus and restore plum raising is of great importance. There have been several remedies proposed and some interesting experiments have been tried the last season at the Massachusetts Agricultural Experiment Station. Below we give some of the remedies, preventive, protective and direct, that have been tried.

REMEDIES.

1. Cut the diseased branches and burn them. (Care should be taken to cut enough wood to include the mycelium. If the tree is hopelessly involved, it should be destroyed at once. Burning is necessary, as the spores are produced on detached branches. The

old knots should be cut before February, and the young ones, as soon as possible after they form, to prevent the formation and spread of spores)

2. Cut and burn all the wild, fire cherry and choke cherry trees near the orchard. (Spores are light and are carried a long way by the wind. Out of the millions produced by an infested tree enough will be carried a long distance to start the disease.)

3. Spraying with a solution of some copper salt has been recommended. As the winter spores are formed by February, and the summer spores commence to form early in the spring and continue to be formed all summer and as it is not known when, where or how the disease is propagated, this method would necessarily be work in the dark. It is based on the belief that the spores lodge on the branches, germinate and spread the pest. Experiments alone can decide its efficacy. If adopted, spraying should be kept up all summer, after every heavy rain. An application in the spring would probably destroy any spores of this or other fungi on the branches. Washing the trunks and larger branches with brine was tried as early as 1863. So this method is not new.

4. Cutting out the warts and applying varnish was tried as early as 1863, but the fungus produced new warts around the old ones. (See United States Agricultural Report, 1863, p. 572.) This served only as a temporary protection. It is to be seriously doubted whether a tree badly affected can be saved. It would be better to begin anew and carefully observe preventive methods. The first knot should be noticed and destroyed, or it becomes a source of infection near at hand. An ounce of preventive in the shape of precaution will save a pound of disease, the sure product of neglect.

5. Painting the knots over with some solution or substance, to destroy the fungus or prevent spore formation, is now claiming the attention of experimenters. This is an old method revived. Townsend Glover in United States Agricultural Report, 1863, p. 572, says: "Even when the wound had been washed with a strong solution of nitric, or sulphuric acid and water the disease invariably appeared either above or below the old scar." Something must be found to penetrate the branch and kill the fungus and not kill the branch, or the remedy would have no advantages over pruning. It certainly will take more time than pruning. Prof. Maynard has published recently (Bulletin No. 4, Massachusetts Experiment Station 1, p. 15) the

results of his work in this direction, and I can do no better than to record his conclusions.

“To determine if there is not a more effectual and satisfactory remedy than that of cutting off and burning the warts (which is in part effectual) the following liquids were applied :

1. Linseed oil.
2. Turpentine.
3. Kerosene.

These remedies were applied with a small brush as soon as the warts began to appear. As they do not all come out at once, examination and application of the remedies were made three times during the summer, all warts being painted over each time.

RESULTS.

In three examinations made with the microscope during the fall and winter, no spores (ascospores) were found in the warts. In fact none of the sacks (perithecia) were developed enough to produce them before the warts were destroyed by the remedies. In some cases where the kerosene and turpentine were applied in so large quantity as to spread around the branch or to run down it, the branches were killed. No such injury occurred where the linseed oil was used.

CONCLUSIONS.

1. Linseed oil, turpentine and kerosene all effectually destroyed the plum wart.
2. Turpentine and kerosene must be used with great care.
3. Examinations should be made at least three times during the summer, from June 1st to August 30th.
4. Enough of the liquids must be applied to saturate the wart.
5. As the plum wart is readily propagated on the wild choke cherry all such trees should be destroyed, and all of the warts upon the trees of the garden (morello) cherry should receive the same treatment as those on the plum trees.

SUGGESTION.

While the above remedies have proved effectual it is suggested that possibly a more harmless remedy may be found in the use of sulphate of copper, although no experiments have been made with it to our knowledge. Applied with the hand pump in the spring,

before the leaves have unfolded, it would probably destroy all spores lodged in the crevices of the bark ; and used in concentrated solutions with the brush it would probably destroy all warts that might start later in the season from the mycelium or spores remaining in the tissues during the winter."

When applied to the young knots kerosene or linseed oil may kill them. This could only be determined by noticing whether new knots are formed around the old ones. Painting the knots would certainly prevent the formation and spread of summer and winter spores and narrow the formation of new knots to sources of infection outside of the tree. The outside sources are wild and morello cherries. These should be destroyed. Mr. Knowlton sent us recently some plum and cherry twigs bearing knots that had been treated with kerosene three times during the season. They contained no summer spores (ascospores) and only imperfect (perithecia) and no winter spores. The mycelium did not appear to be dead even on the young knots. This method should be tested farther and we hope those who raise plums will paint the knots with linseed oil. We shall do so and also try to discover the missing links in the life history of this fungus.

REMARKS.

It must be apparent from what has been said, that the tendency of the times is toward the use of chemicals, as preventive and direct agents, against the attacks of injurious fungi, and that the copper salts have proved the most efficacious. To apply these, spraying apparatus has become almost as essential as the plow and hoe. Great importance attaches to a proper selection of apparatus for the different kinds of spraying, and the right fungicide or insecticide. For this reason we have placed on exhibition a few pieces of spraying apparatus, that have been tried by experiment station officers and recommended by them. These will be explained to any who wish information regarding them.

It must also be apparent, that a knowledge of the life history of fungi is most important as a basis for the application of remedial measures ; in order that there be no waste of time and expense in trying unreasonable methods or those that have been tried and found useless. With the name and life history of a fungus known ; with a knowledge of the remedies that have been tried and found worthless or useful ; with an intelligent plan of action based upon the life

history, the experimenter is prepared to begin on intelligent and hopeful warfare. The specialist has the apparatus and books and is better prepared than any one to give this information.

It is a part of the work of the Station Botanist and Entomologist to study injurious fungi and insects. He will therefore always be pleased to name plants or insects sent, and give, if known, their life histories, and if not known he will study them and report. It is also his duty to impart information regarding remedies and their application and coöperate in trying new experiments.

The Station Botanist and Entomologist desires to make himself useful in this capacity, but cannot be expected to take upon his shoulders the burden of exterminating the injurious insects and fungi of the State. It would be too great to bear. Even with a thorough knowledge of a pest, we may be largely at its mercy. There are often thrown around parasites, strongholds, that even man with his boasted strength cannot break down. The Creator and not the entomologist should be held accountable for this. It may well be doubted whether man has dominion over the whole animal and vegetable kingdom. We think he has his match in several injurious insects and fungi. We must not, however, give up the advantages we possess, that have been gained by study, but make best use of the means at hand, striving by more careful research for greater advantages. Insects do not change much in their habits, but man aspires to higher achievements and possibilities. Each year brings some new light, showing man has not yet reached the limit of his dominion over the lower animals and plants and may yet succeed in putting all things under his feet. We heartily sympathize with the farmers and horticulturists in their warfare with injurious insects and fungi, and promise to be their faithful ally, hoping that persevering and patient research will finally bring their reward.

THE EXPERIMENT STATION AND ITS WORK.

By D. H. KNOWLTON, Member of Advisory Board.

EXPERIMENT STATIONS IN GENERAL.

Agricultural experiment stations in this country are of recent date. They may be considered as the offspring of our necessities. There are several notable experiment stations, or experimental farms, in Europe, which have covered a large field of observation and study, and to them we are indebted for much of our knowledge of feed properties and values, as well as the crop producing values of manures and cultivation. The conditions of soil and climate in the United States are so different from European localities, that beyond certain scientific data, the conclusions reached had little practical value for the American farmer; for to make many of the results available, they must be interpreted and adapted to our conditions. From the primitive methods still employed by the majority of European farmers, there is doubt whether these stations have really effected any great change in European agriculture, and, as far as any great change has been brought about there, it is more largely due to the importation of the cheaply-produced crops from the United States, South America and Australia. At any rate, the changes in European farm methods have been less rapid than in this country where our farmers so generally read and study the agricultural papers.

We have no desire to underrate the work of these stations, for they have been of great value, not only to Europe, but to the United States as well, for the results have been largely drawn upon by our agricultural writers and chemists. The data furnished have been of great value, but in order to utilize many of them there was need of experimental work in our own country. In the United States the increasing competition in the production of crops has necessitated many changes in farm methods. The first great question was how to produce crops the most cheaply, involving a knowledge of soils, their cultivation, and the value of manures. The next question is how to dispose of the crops after they are raised. If they are to be marketed, it is a matter of business, but if these crops are to be utilized in the growth and rearing of stock, the demand for an

accurate knowledge of their feeding values becomes imperative. It is an old saying, that "necessity is the mother of invention," and the attempt to answer these questions gave birth to our agricultural experiment stations. The first one was established in Connecticut in 1875, and its early work in analyzing commercial fertilizers and publishing the results, saved thousands of dollars to the American farmer, who, until the fertilizer was used, was unable to determine whether he was purchasing old leather scraps compounded into a highly odorous mixture, or a valuable food upon which his plants would grow and thrive. So important was the work done by this pioneer station, that a demand arose for others, and there are now no less than fifty established in different parts of the country. With such a trained corps of educated workers, the scientific features of agriculture are likely to be developed quite as rapidly as the farmers are educated up to their adoption. Under the general guidance of a national station and the association of directors, which meets frequently for the discussion of methods and work, we have abundant reason to expect much from them in the future.

MAINE FERTILIZER CONTROL AND AGRICULTURAL EXPERIMENT STATION.

Here in Maine our legislature, in the winter of 1885, passed an act locating and establishing the Maine Fertilizer Control and Agricultural Experiment Station in connection with the State College at Orono, and appropriated the sum of \$5,000 annually for its support. This station existed for about two years and a half. Its work consisted very largely of the inspection of the commercial fertilizers sold in the State, and in conducting a few farm and feeding experiments. As a matter of fact, the means were entirely inadequate for carrying on satisfactory experimental work. As a preparation, however, for the larger work of the present station, it certainly did all we could expect, though some who had anticipated great results, without measuring their cost in money and labor, were disappointed.

THE HATCH EXPERIMENT STATION.

The "Hatch Act," so called from its author, establishing an agricultural experimental station in every state, went into effect Oct. 1st, 1887, and our legislature in consequence repealed the law under which the original station was created. Under the "Hatch Act," the sum of \$15,000 is annually appropriated for each station,

but for some reason the first payment was not available till February, 1888. The law establishing the station makes it a department of the State College, the general oversight being vested in the trustees of that institution. The college, in order to receive the appropriation from the government, must show that the funds are wholly applied to agricultural research and experiment, and not to the general use of the college. In other words, the trustees of the college have charge of the funds, but expend them in carrying on the work of the station.

Under the conditions of this law, the first work was to provide suitable buildings, and furnish them for the purpose intended. This used all the funds permissible under the law for the first year, and drew somewhat on the funds for the second. As a result, however, the station is now provided with good quarters, and is well equipped for experimental work. As already stated, the general oversight of the work is placed in the hands of the trustees of the college, who, at a recent meeting, voted to create a "council" for the purpose of laying out the work of the station from time to time, subject to the approval of the trustees. The work of the council, as will be seen, is advisory, but as it is composed in part of the trustees, the recommendations are likely to be conclusive. Desiring to have the various agricultural industries of the State represented in this council, the trustees proposed that it consist of the President of the college, the farm committee of three from the trustees, the Director of the station, and his associates. The State Grange, the State Board of Agriculture, and the Maine Pomological Society were each invited to send a member of the station council. The council thus far has held two sessions, and we believe it is the intention to hold two sessions annually. By courtesy of President Pope, and the approval of the executive committee, your speaker was elected to represent the interests of the Pomological Society.

THE GENERAL WORK OF THE STATION.

It is not the purpose of this paper to pass in review the work of the Station, for the opportunities for studying it have been too meagre, even had I the desire to do it. It is a satisfaction, however, to note that while the work thus far has been preliminary, it now appears to be well organized. The various fertilizers sold in Maine have been analyzed, the results have been published for the benefit of the farmers, numerous farm experiments in growing crops by the

use of different fertilizers have been conducted, the vitality of seeds offered for sale in the State has been tested the past year, and with the live stock several feeding experiments are being conducted, and some of the results have been made public. The diseases of farm animals are made special objects of study by the veterinarian, as well as the conditions of food and shelter that secure good health.

There are other features of special interest, but time will only permit reference to one or two lines of work of a general nature. In order to raise large crops, and to raise them cheaply, it is important to know what kinds of plant food are the best for this purpose. Should the seeds be planted in the open field, no one can tell with certainty from what source all the plant food does come. To gain this knowledge a series of experiments is being tried at the Station, called the "pot experiments." The problem to solve is, what makes the plant grow? Pots of suitable size are filled with ground glass, or clean sand, in which no available plant food is found; in these pots seeds of the same kind are planted; chemically pure water is used to water them. The pots must be marked and a record of every condition so far as known must be made. When the seeds begin to germinate, the several pots are treated with the various kinds of plant food in soluble form. One receives nitrogenous food, another potash, another phosphoric acid, and others receive some combination of these. Results are closely watched and noted for reference, under which treatment does the plant thrive the best? A definite result may not be reached this year, but it is believed this line of work accurately followed for a series of years will give results in determining the most economical manures to apply to our various crops.

SPECIAL WORK OF THE STATION.

A few years ago, from some unknown source, a troublesome little insect settled down among us in Maine. So small an insect was hardly noticed at first by our fruit growers, but when our King Sweets and other summer favorites were found to be the abode of a disagreeable maggot that would peep out at one at every mouthful, we began to feel uneasiness, and wonder what business the creature had in Maine apples. Year by year the insect spread over the State, till its presence is recognized in nearly every county, and an alarm exists among fruit growers lest the *Trypeta* may ruin not only our autumn fruits, but spoil the sale for our winter apples. In

Professor Harvey's excellent work on the *Trypeta pomonella*, we have another illustration of the manner in which our experiment station may aid the farmer. Already the Professor has brought to light the life history of this new pest, and before his labors are completed I anticipate he will prove the insect's worst enemy.

As our Society is more especially interested in fruits, and as the raising of fruits is one of our most important agricultural industries, I will mention some of the work intended with reference to them. Requests have been made for the establishment of branch stations, but it seems unwise to do this at present. The first work of the station is one of organization, and until the work there is well in hand, it would be folly to attempt the running of branch stations. This work of organization, by the way, is one of many intricacies, whose difficulties can only be hinted at when we say that no chance work can be permitted. First of all, before a successful experiment can be undertaken, the one who has charge of it must have a clear-cut idea of the results sought for, as well as the manipulations by which they are to be reached. Conditions have to be considered at the outset, and measured, so to speak; then at every step there must be the greatest accuracy, and records of the whole must be plainly kept. Then from the data recorded, conclusions may be drawn, or perchance the experimenter finds he has failed to recognize some of the conditions, and the ground has to be gone over again. Nor is it safe to accept the results reached in a single season as conclusive. Not many years since, Dr. Sturtevant conducted some interesting experiments in planting corn grown on different parts of the cob. The first year's results showed that the tip kernels possessed the greatest germinating power, and gave the largest yield. This was perfectly astounding, for our fathers taught us years ago to give tip kernels to the pigs. The experiments seem to have been well conducted, but the next year, alas, the results reached the first year were all set at naught, and in succeeding years, we believe, the experiments confirmed the practices of our fathers.

THE PROMOTION OF FRUIT CULTURE.

Fruit culture, although one of our important industries, is rapidly increasing in extent. In Aroostook and other parts it is in its infancy. There never has been a time in the history of the Society when there were more inquiries, searching after the best varieties

for profitable culture. At our exhibitions and public meetings, our members are "under fire" all the time. It is impossible to give all the information sought, but it is believed the station may come to our aid now, and "lend a hand." Having in mind that the station should begin its work at once, nursery stock was ordered from Ellwanger & Barry, and last spring, trees and plants were set as follows: Thirty-three varieties of apples, thirteen of plums, seventeen of strawberries, six of grapes, two of currants and one of gooseberries. Of the trees, two of a kind were set, and of the small fruits, six or more. More trees will be set the following spring. With hardly an exception, every tree and plant grew, and after a single season's growth, one rarely sees a handsomer lot. Scions were cut from these trees so far as possible, last fall, and these are now stored, ready for distribution throughout the State. From the small fruits, plants will be propagated the coming season. The object of the distribution is to determine the adaptability of varieties to the different parts of the State. These scions will be set under the direction of the station officers, and records will be kept. In this way, it is believed, a fruit list will be made up that will prove far more reliable than any that can be made from results obtained in a less thorough manner.

It is already well known that most varieties of apples grow and thrive in the State, but it is not yet known what the limits of successful growth of these varieties may be. I have often thought this would be a good work for our own Society to do, but the amount of labor involved in it has held me back from attempting it. I could make the beginning, but the next secretary, unless the funds of the Society should be largely increased, could not be expected to follow it up. But I am glad to know the station will undertake this work. The plan is simply this: The Baldwin, for instance, is the variety. First, in a suitable book for the purpose, the history and description of the variety are placed; the general conditions of soil, location, etc., under which it is known to succeed; then the conditions under which it does not succeed. Then record, from known results and results to be obtained, the actual areas in which the variety flourishes. It may also be proper to record any peculiarities of the variety which may be developed in any section; its quality, its liability to attacks from insects and diseases, hardiness, etc. This kind of labor, followed for a few years, will give us a fruit map, so to speak, of the State, and something that will be of great value to our interests.

The field for experimental work is of large extent. It is two-fold in its nature, scientific and practical. It may be scientific and not practical, and again, it may be practical and not scientific. The grand object of the promoters of the agricultural experiment stations was to make them of practical value to the farmers as producers of the sustenance of life; and secondarily, of importance to the world at large. There has apparently been more or less confusion among the stations in formulating the work to be done, but the general organization of the stations will remedy this confusion, and give unity to their purposes and plans. The directors of the stations are men who have been selected for their several positions in consequence of their scientific attainments. They are, so far as we can judge, disposed to make the general work of the stations practical; at the same time, they are quite unanimous that it shall be scientific. This suggests the tendency, which in some of the stations is already too apparent, to make them purely scientific. The station officers are engaged in study and research, and are disposed to learn all there is of importance on the subjects under consideration. They are associated in their work, and know little of the necessities of local agriculture, and there is good reason to suppose they will be likely to pursue only those investigations that are most congenial to their tastes. There is certainly a tendency that way, not premeditated, but perfectly natural. There is only one remedy for this, and that is, to have the interests of the farmer brought home to them. In our own station, the officers are sincere, earnest workers, and express the wish to undertake the lines of work most important to the farmers. But if the farmers fail to make known to the officers of the Station what work they need to have done, it naturally follows that the station officers will select their own work. Thus far, there have been two meetings of the council. Your society was the only organization, outside the college and station, that was represented. Probably there will be no meetings in future of equal importance, as at these meetings the future work of the station was agreed upon. Should this policy continue in the future, the results may not be entirely satisfactory to the farmers.

REPRESENTATION OF IMPORTANCE TO THE FARMERS.

There is only one remedy for this, and that is, to secure in some way representation at all the meetings of the council, where the work done is subject to criticism, and future work is discussed and

laid out. The station pays the expenses of the members of the council, but no provision is made beyond this. It may be advisable that the bodies which have been invited to send a member to the council, should pay their respective delegates a reasonable compensation for their time. There are few in this busy world who can afford to leave their work for several days without some pay. By all means, secure representation at the meetings of the council. The results may not be so apparent as they sometimes are when a few politicians manipulate the party caucuses, and thereby determine vast State and national interests; but the interests of the farmers may be involved in all the essential details that go to make up the warp and woof of profitable production.

In conclusion, I have endeavored to give you briefly the origin and history of our experiment station. I have shown you somewhat of its work. I have also called your attention to the tendency of the station to engage in purely scientific investigations, and pointed out to you the only way in which you can insure work there that shall accord with your interests. This leads me to say that, to the full extent permissible, every farmers' organization should be represented in its management, but it is useless to send men there who have not the ability to discern our needs, or who may be indifferent in pressing them before the station officers. The institution was intended for your benefit; in short, it is yours. Your representatives should first of all be in full sympathy with your work. They should be men of education and sufficient mental calibre to comprehend the work needed, to measure the interests involved, to see beyond the experiments the object sought for. Last, but not least, they should be men who have the courage to insist upon having work carried on that is strictly agricultural, for it matters not how good the heart may be, how clearly the object may be comprehended, if there is not behind it the working faith that perseveres unto the end.

MAINE FRUIT GROWERS' EXCHANGE.

During the State Fair Meeting, President Pope presented the following paper:

HOW SHALL WE MAINTAIN THE PRICE OF MAINE APPLES?

By CHARLES S. POPE, Manchester.

Is there any profit in orcharding? This question which we have heard so many times of late, has set some of us to thinking that it is time to change our methods, or we must give up the raising of apples altogether. Many orchardists in this section the past year did not receive enough to pay the expense of handling. Others sold for a good profit. Now why should there be this difference? I have just visited one of the largest orchardists in Kennebec county, to learn, if possible, how he obtained \$2.25 for his Baldwins when the buyers were paying \$1.00 only. From what I could learn the great secret was perfect sorting and careful packing, and then shipping direct to England.

Apples from Maine have been in good repute in England, and the price, generally higher than for apples from any other section, but the returns last year must have been anything but satisfactory to most of the shippers. When the price is low the fruit grower will be very careless in handling his fruit, both when picking and packing, and the majority think the more poor apples they can crowd into the middle of a barrel and have it accepted by the buyers the better. The buyers in our section are very careless and will take almost anything if it can be purchased low enough. They will put a few good apples at the top and mark it with a string of X's, and sometimes are fortunate enough to get a little profit on such a lot. Very few of them did last year. This ruinous policy must be stopped if we expect to keep up the reputation of Maine apples.

With the present methods of selling, what inducement is there for an orchardist to pack his apples in good shape? Unless he is an extensive grower, his apples are lost, comparatively speaking, in the thousands that are shipped, and he gets small returns for his pains. From the appearance of apples, as they are opened in the auction rooms in Liverpool, it would seem that the science of packing apples correctly is understood by very few of our people. It is surprising what an immense amount is lost by poor packing, causing what they call "slack" and "wet" and the question is, how shall we remedy this and obtain a fair price for our fruit?

Many of our large orchardists, by careful sorting and packing, have obtained a reputation in our local markets, and the name of

such grower on a barrel of apples is sufficient to sell the same at a good price, even without the trouble of inspection. Now we wish to do the same thing abroad. But who of us raise enough to make any show in the thousands which are sent across the ocean?

The plan which I shall present to you this evening is this: That we form an association of fruit growers which shall oblige all its members to sort their apples according to a set standard. This, we think, can be done by appointing inspectors who shall show the several growers how the apples must be sorted and packed. Each brand will then be marked with the association brand or label giving the name of the grower, requesting the party who buys the fruit to notify our secretary if the fruit is not put up according to our standard. This will be a check on those who might be disposed to cheat. We believe the brand of such an association, if properly managed, with efficient officers, would be a guarantee for good fruit well packed, and would give us a reputation and a profit, instead of a loss in handling our apples.

I think it is time for us to leave the middlemen, not that they are getting rich at our expense, but because of their disastrous methods of sorting. With the carelessness of most of the buyers in sorting, our State must soon lose her reputation for first-class apples. Nor is this all; we are losing money all the time by this pinching policy. Two-thirds of the apples would bring more money, with less expense by far. We must have better sorting, better packing, and thus less loss by rotting, wet and slack-packed apples.

The officers of the association should keep its members informed of the state of the market and give them the names of reliable firms abroad to whom they can ship direct, and such other information as shall enable them to sell in a good market, at a fair price.

But to return. How will an association benefit the fruit grower?

First. By teaching the proper methods of sorting and packing, that the fruit may arrive at the market in such shape that the loss will not eat up all the profit

Second. By allowing only first-class fruit to be put in as No. 1. and obtaining a better price, and in a few years establishing a reputation which will command higher prices.

Third. By selling direct to the wholesale dealers and saving two or three commissions.

Large interests are involved in this, and if the fruit growers are sufficiently interested it is important that measures be taken at once for an organization of such a society.

The address was referred to a committee consisting of J. W. True, H. W. Brown and C. H. George. At the winter meeting the committee reported as follows :

OUR NEED OF ORGANIZATION.

By J. W. TRUE, New Gloucester.

It is needless for me to take up your time in trying to prove that united effort in any given direction to accomplish any definite results can be done in very much less time, than as though each individual was working on a plan of his own, even if that plan was to work out the same desired result. Whenever a condition exists that tends to affect the interests unfavorably of any considerable number of people, especially in this free country of ours, the subject begins to be agitated, talked over, plans made, and not a few tried, to change those conditions, and in some cases they succeed to quite an extent ; but when the subject is too large, extends too far and one life is not long enough to accomplish it, then men turn to each other and unite their efforts with a single aim toward the accomplishment of that much desired change for the better.

Now the question that confronts us to-day is whether our Maine apples shall be made to maintain and improve their reputation in the foreign markets—and how it shall be done. In the first place let us consider for a moment whether under existing circumstances this condition is being accomplished. Within the last two or three years it has been the custom for a few men known as shippers to buy up or engage all the Maine apples they positively can early in the season, so that in a short time after the crop is harvested, nearly all of it passes out of the producer's hands and into the hands and under the control of comparatively a few men, and each individual fruit grower tries to sell his stock to the best present advantage to himself, and for that reason it has become the rule to sell his No. 1's and 2's just as they come at the same price, (with the exception of the culls) with the understanding that the buyer is to pack them, and the universal testimony of the producer is that the packer takes them very nearly to an apple, puts in apples that they should not think of selling. In fact, I heard one packer say of another that "he put in apples that he would be ashamed to offer to his cow." The producer is pleased with the transaction, he sees a part of the barrels marked with a pencil No. 1 B, for Baldwins, or No. 2 B, etc.,

and thinks it is all right, but before those barrels go onto a steamer, they are regularly marked with stencil plate. I have recently talked with two parties that happened around when their apples were being marked, and it read something like this, the No. 1 B's were marked *Fancy Maine Baldwins*, the No. 2 B's were *No. 1 Extra Maine Baldwins*, and one of them (who has sold 200 barrels this year) said that he should be a little diffident about standing before the *consumer* and acknowledge that he was the producer of that barrel of *No. 1 Extra Maine Baldwins*.

Then again, the shipper is in a hurry to buy so as to get all he wants, and the farmer is anxious to have them packed at once so as to avoid loss by shrinkage, and a large quantity is barrelled up before they are wanted to ship, and we personally know of lots that were bought before the crop was all gathered, to be packed at once and they had not all been shipped, February 1st. Another lot that was packed early was partly re-packed, the balance just opened and the decayed ones that were in sight picked out, the head replaced, and sent to market in that condition. What shape must those apples be in after their transportation to a foreign market when they reach the consumer? One of the obstacles to a reformation in this business is that the producer appears to lose nothing at the time; in fact, he feels that he is the gainer in two respects, the packer takes all his apples and takes them at once. If there is a loss it appears to fall on the buyer, but if he makes but a small margin on each barrel by handling large quantities he makes money out of his winter's work. The loss to the producer comes in later. The Maine apple does not stand quite as high in the market as those from some other localities, notably Canada; the buyer cannot pay quite as high a price next year, but he will buy and pack the same as the year previous, giving satisfaction to the farmer as before. It should be our aim to change all this. We produce or could produce as fine apples as are grown in any part of the world, and what we desire is to have some system by which our fruit may be packed uniformly and marked honestly, so that when a barrel of apples is ready for market the producer could stand before the consumer and acknowledge without a blush that he raised, packed and marked those apples. When we have accomplished these results the price will improve from year to year over other stock that is sent under present conditions, and in order to achieve this we must have organized effort, have an inspector to look after and instruct the farmer in a uniform

method of packing and marking. An association must be formed with officers, rules and regulations which the officers must see enforced, and the more strict the enforcement the better will be the results. It possibly might be thought best to send an agent to Europe to inspect the markets and to represent the association in the matter of business and perhaps as time goes on it will be thought best to establish a Fruit Exchange with store-houses arranged for the cold storage of our apples. There are great possibilities for such an organization, but the first great object is to get started, even if in a small way, and then by feeling our way along and finding out just what we want we will have courage to take hold of the more formidable problems as they may present themselves. We herewith present a few articles and rules under which it seems to us we could form such an organization as we believe would be of great benefit to the fruit growers of Maine.

BY-LAWS.

We, being fruit growers in the State of Maine and desirous of improving the quality of our fruit and arranging for a more uniform method of packing, marking and disposing of the same, hereby form ourselves into an association for that purpose and agree to be governed by the following by-laws :

ARTICLE I—*Name.*

This Association shall be known as the Maine Fruit Growers' Association.

ARTICLE II—*Membership.*

SECT. 1. Any fruit grower may become a member of this Association by paying a membership fee of — dollars.

SECT. 2. Each member of this Association shall pay an annual assessment of — dollars.

SECT. 3. Any member violating any of the rules or by-laws of this Association upon complaint coming to the Secretary, shall receive a notice from the Secretary, stating the complaint, with a request that more care be used to observe the rules, and for second complaint shall be given a hearing before the full board of officers of this Association, and if, in their judgment it be for the best interests of the Association, the member may be dropped from the roll of membership.

SECT. 4. Every member of this Association shall be entitled to one vote.

SECT. 5. Any member may vote by proxy provided he give notice to the Secretary of this Association.

ARTICLE III—*Officers.*

The officers of this Association shall consist of a President, Vice President, Secretary, Treasurer, and a board of three Trustees, the President and Secretary being members of the board *ex-officio*.

ARTICLE IV—*Duties of Officers.*

SECT. 1. The President shall preside at all meetings of the Association and shall be chairman of the Board of Trustees. In the absence of the President his duties shall be performed by the Vice President.

SECT. 2. It shall be the duty of the Secretary to keep a record of all the proceedings of the Association and of the Board of Trustees; to give to all members a proper notice of time and place of all meetings of the same.

SECT. 3. The Treasurer shall have charge of all the funds of the Association and shall disburse the same in accordance with a vote of the Association or by order of the Board of Trustees. He shall give bonds for the faithful performance of his duties if required so to do by the Board of Trustees.

SECT. 4. The Board of Trustees shall have a general supervision of all the affairs of the Association. They shall establish a standard by which all fruit sold under the Association brand, shall be packed and marked.

ARTICLE V—*Election of Officers.*

SECT. 1. The election of officers shall take place at the annual winter meeting of the "Maine State Pomological Society" unless otherwise ordered by the Board of Trustees.

SECT. 2. All officers shall be elected by ballot.

ARTICLE VI—*Term of Office.*

The term of all officers shall begin when chosen and continue one year or until their successors are chosen.

ARTICLE VII—*Quorum.*

— members shall constitute a quorum to do business.

ARTICLE VIII—*Amendments.*

All amendments of the "By-Laws" may be made by a majority vote of all members present.

DISCUSSION.

MR. G. F. HAMMOND. It is well known that the present method of disposing of our apples is a very faulty one. We now sell to middlemen who purchase for shipping to foreign markets and there are two or three profits on them before they reach the consumer. We desire to reach the consumer more directly. The fine flavor and high color of our apples gives them a value above those raised elsewhere, and we should be able to dispose of them in such a way as to get the benefit of it.

MR. H. W. BROWN. As a member of the committee I have tried to learn something about the practical working of other organizations similar to the one proposed, but have not succeeded in learning much that can be of value to us. As a general thing these fruit exchanges are nothing more or less than commission houses. They receive fruit from various quarters, place it in their store-houses, assort it, and in selling put their own special brand on the best fruit and sell the remainder as ordinary. The buyers that go through the country seem anxious to get everything regardless of quality, and so manage them as to make a large profit. We must organize a society if we can, but it is a matter of great difficulty. We want to make some arrangement to handle and manage our fruit so that we can stand behind it ourselves. We must establish a market where we can obtain first-class prices for first-class fruit, but I hardly know how it is to be done. When farmers are satisfied with what they are doing and getting, it is hard to get out of their present track.

DR. G. M. TWITCHELL. For a series of years some of the patrons of Northern Aroostook have massed their wool, placing it in the hands of a representative of the order to be sold, and have realized from two to five cents a pound more than was paid to others. I merely mention this to show what you can do in a similar manner by combining for the sale of your apples.

MR. POPE. I think there are a few fruit growers here who feel that such an association is desirable, but it will require much wisdom

to make it a success. It cannot be done unless we take hold of it heart and hand. Our people are so well satisfied that they cannot look ahead. Our reputation now is below that of New York and Canada and yet we can raise as good fruit as they. Our buyers have been buying the whole crop, putting the poor apples in the middle of the barrel and the good ones at the top and bottom, and we are the ones to suffer in the long run. We have great difficulties to meet in organizing an association. How is it going to be possible to prevent a man from putting in bad apples and marking it with the brand of the association? If we could raise capital enough to provide for bringing the apples all together to one point and having them assorted or inspected it might do, but that would be very expensive. Not a quarter part of the growers of apples know how to pack. Some pack too loosely and some too closely.

Mr. KNOWLTON. I do not rise to discuss this matter now, but to impress upon you and those present the importance of the subject. I think our president has touched the key-note exactly, in combining his remarks with those of Mr. True concerning the satisfaction of farmers with the prices they are receiving this year. The question is not about this year, but looking forward into the future what is it that is going to sell Maine apples in competition with those of other places? If I were a large grower of apples I would not risk my reputation in the hands of men who go through the State and buy apples for speculation. The only safety in past years for large growers, has been to pack the apples themselves and place them where they could get good prices. I will refer you to the case of our president here in illustration of the point. His apples have sold from one dollar to three dollars a barrel in excess of the general market price because of the reputation he has won. I will call upon my friend, Mr. Whittier, to give us his experience.

Mr. WHITTIER. I would say that the best way that I can do is only to market my best apples in a green state and evaporate the inferior ones. I take the same pains with the evaporated apples as with the green apples so as to establish a reputation for them. By keeping the inferior apples for evaporating I get as much for the choice apples as I could for all together as they are usually handled. It has previously cost me about two and a half cents a pound for the labor in evaporating. This year I have obtained a better evaporator and it has only cost me about two cents. This year I got a little over seven pounds to the bushel of apples. The whole cost amounts

to just about three cents. That would be about twenty cents a bushel. Last year the evaporated apples would sell for nine cents a pound, but this year they bring from nine to twelve cents.

In most years it does not pay to send fall fruit to Boston. Only once in a while will it pay to send second quality apples to Boston. One-half of the apples which I evaporate would pass for a second quality and the remainder such as we would feed out to stock or make into cider.

Question. How small apples do you put into your No. 1's?

Mr. WHITTIER. That depends upon the kind of fruit and the quality. In the case of Baldwins I would put in an apple two inches in diameter if it were fine and smooth.

Mr. KNOWLTON. I am thankful to Mr. Whittier for establishing a point in connection with this matter of a fruit exchange. He is a large grower of fruit and does not care whether we have an exchange or not. His apples are going to sell first anyway. But there are few who raise apples enough to get the reputation of Mr. Whittier even if they exercise the same care.

Now the idea of this fruit exchange is to meet just that point, so that the man who raises ten barrels or even two or three barrels by following the directions given may have the advantage of just the same reputation that Mr. Whittier has won for his fruit.

I am not willing that the matter be dropped here. I do not desire to press the matter at this time, but that it shall have further consideration, I move that the committee be continued, so that if they see any way to carry the matter further in the future they may do so and bring it before some future meeting.

[In accordance with this motion the committee was continued for the ensuing year and the matter referred back to them for further consideration.—SECRETARY]

REPORT OF COMMITTEE ON NEW FRUITS.

D. H. KNOWLTON of the Committee said: There are many different varieties of apples sold in this State by agents, some of which are not known to the officers of the Society. We have a great many enquiries from farmers from time to time.

My attention has been called to the Wealthy apple. You are all aware of its beauty and excellence. An objection is that it drops badly, but it is claimed that if picked as soon as it is ripe it will not drop any worse than other varieties. If picked at the proper time it will keep till late in winter.

Mr. BLOSSOM of the Committee: I wish to call attention to two varieties of apples which have been confused. Agents have gone over the country and represented the Stark and the Starkey as the same apple. They have been placed on exhibition at the State fairs, both as the same apple. The Starkey originated in Vassalboro', Maine, on the farm of Moses Starkey. It is very vigorous and hardy. Its season is from October to January. The Stark is of unknown origin. I raise the Stark. When the trees first came into bearing I recommended it, but I find that the more I raise it the less I like it. Its greatest fault is that it drops from the tree early in the season which is a fault for a late winter apple. I have no apple that the codling moth seems to take to so much as to that. I will speak of an apple grown in some parts of the State and which should be grown more than it is. The tree is hardy, and there are few better apples in the State of Maine. It is the Milding. It is an old apple, having been raised to some extent for quite a number of years. I find we can raise this variety in places where we cannot raise the Baldwin.

RUSSIAN FRUIT.

By Dr. T. H. HOSKINS of Vermont.

I suppose that this subject which has been announced is one upon which there is as little general knowledge as any subject in pomology. In all the great fruit growing regions there are established varieties and there is but little desire for new ones. There have been attempts, on the part of tree agents, to introduce Russian apples in districts where they are not required. We may state, in the first place, what is meant by Russian fruit.

About fifty years ago three varieties were introduced from England, obtained there from Sweden and introduced as Swedish apples; the Duchess, the Red Astrachan, and the Alexander. Some other varieties were brought at the same time, but did not attract so much attention. The Red Astrachan was found to succeed equally well in Maine, in Louisiana, and on the Pacific coast. It originated in the Province of Astrachan where the climate is not so severe as here. It is not strictly an iron clad variety. The Duchess of Oldenburg got an almost equally wide distribution. It has proved better in quality, and the farther north it is grown the larger and better it is. I sent Mr. Downing a specimen of it and he was so struck with it that he sent for scions, but afterwards found that it was the same as his own.

The first Russian apples introduced proved very satisfactory, because they are susceptible of being successfully grown in so many different locations. An attempt was made to have other varieties imported from Russia and an appropriation was made by Congress for that purpose. Between two and three hundred varieties were imported and distributed. The distribution was made, as is usual among Congressmen and their constituents. They should have been distributed among nurserymen and responsible and interested parties. The parties who received those varieties must have thrown them out of doors or burned them up. At all events, out of 300 kinds imported I do not know of more than about forty now in existence.

About eight years ago the people of Iowa, feeling the necessity of hardy varieties, sent the professor of their horticultural school to Russia. He visited all the fruit districts and brought home a good collection, as numerous as that of the government. A neighbor of

of mine, over the Canada line, also brought from Russia a good collection.

The Alexander is a very popular apple, and the Duchess sells as high in market as the Gravenstein. This is surprising to some, but it must be remembered that only a small portion of our apples are used for dessert purposes. By far the larger part are used for cooking. The Russian apples are not, as a class, inferior. The most of them are early bearers, and the fruit averages large and handsome. A fair proportion of them are of fair dessert quality. Perhaps the proportion is as great as in our American apples. There are a dozen out of the Russian varieties better in quality than the Baldwins.

The Russians handle their apples with greater care than we do, and in that way they are able to keep them very well. Our apples are so good keepers that we are in the habit of abusing them. Their season is very short and filled with vivid sunshine. The apples must mature quickly and be gathered early in September. In sweet apples, and nice early apples the Russians are well supplied.

I think that out of the two or three hundred Russian apples imported and now being tested in the Northwest we shall have an abundance of good fruit for supplying Aroostook county with all they will need. I think for Aroostook, the Wealthy will take the place of the Baldwin.

In regard to the other tree fruits of Russia we know but little. The Russian pears are evidently a distinct variety or a distinct species. Some of them have a very thick, glossy leaf. I think they are descended from the stock of Northern Asia. They show a wide difference from our pear trees. In their vigorous growth of foliage and exemption from the injury of insects and fungous growth they are quite wonderful. I have trees ten feet high that were brought over in 1884.

The Bessemeanka is grown a great deal in Germany. My own trees have blossomed two years but I have only obtained a single pear. There is quite a discussion with regard to the quality of this pear. It seems to be the principal pear in Russia as the Bartlett is in New England.

There is a great number of Russian plums and a great choice among them. I have fruited only one kind as yet, called the Early Red. It is of good size and somewhat larger than the Lombard. In ripening, it first becomes yellow, then purple and then red. The

plums of Russia do not seem to be so different from ours as the apples and pears.

The cherries come largely from Northern Germany. Several kinds we have proved to be hardy. They belong to the Mazzard family. They are cherries that grow and improve after they are colored. If you can protect them from birds till they are ripe they are good, for an acid cherry, as good as any I know. They do not grow very high but bear profusely.

DISCUSSION.

Mr. KNOWLTON. Do you consider the Keifer pear adapted for Maine?

Dr. HOSKINS. The Keifer pear and all that class of pears, are better the farther south they are grown. In New England they will never be of any use except for cooking purposes. Probably the Keifer is the best cooking pear known. Pears generally lose their flavor in cooking but the Keifer is improved by it.

Mr. KNOWLTON. The question is whether we wish to buy for Maine, a pear that only possesses good cooking qualities?

Mr. POPE. I have fruited that pear half a dozen years. The best I could do has been to get one pear, the size of a hen's egg, and a meaner pear never was grown. I did not try to cook it because I did not think it was possible.

Dr. HOSKINS. That flourishes in the Southern States, but will not do well even so far north as the Middle States.

MAINE FRUIT AT THE BAY STATE FAIR.

By HENRY W. BROWN, Newburg.

The officers and members of the Maine State Pomological Society collected and sent an exhibition of apples to the Bay State Fair, held in Boston the second week in October, 1889, of which I had the charge. The collections and display of apples were fine, being shown in a very high, attractive, well lighted building with plenty of room. The number of entries in the apple department was large, there being several entries in the collections and a very large number of entries of single plates. The apples were all shown on large flat plates with just twelve specimens on a plate. This feature added much to the fine display. The largest collection was exhibited by Warren Fenno of Revere, Mass., and consisted of fifty-two plates of apples and pears. The first premium of \$50 was awarded to him. The Maine State Pomological Society in this department had twenty-eight plates and received the second premium of \$30. The Society also took premiums on ten single plates as follows: Charles S. Pope, Baldwins, \$3; E. H. Keniston, Fameuse, \$3, Porter, \$3, Tompkin's King, \$3, R. I. Greening, \$2; A. N. Goodrich, Garden Royal, \$3; C. B. Nottage, Pumpkin Sweet, \$2; H. W. Brown, Maiden's Blush, \$2; Mother, 3; Talman's Sweet, \$3.

There were apples in the collection grown in different parts of the State, among which was a plate of McIntosh Red from Franklin county. There was no plate in the entire exhibition of fruit that attracted so much attention from visitors as this. It was superlatively fine.

In addition to this report I will call attention to some of the exhibits I noted while at the fair. The display of pears was very large and fine. There must have been nearly four hundred plates, from the smallest Seckel to the large Duchess. Of the latter variety there were twenty-eight plates, from which it was not an easy matter to pick out the best. The committee selected eight plates which they considered the best, and put them in the scales in order to get the three heaviest, on which to place the premiums. The lightest tipped the scales at thirteen pounds two ounces and the heaviest at thirteen pounds four ounces. Four of the heaviest on this plate weighed one and one-fourth pounds each. The Louise Bonne de Jersey came next

in order as to size, and the showing of this variety was large. But for beauty the Sheldon takes the lead; there was a very large exhibit of this variety, all being placed on large platters on a table together. They looked very fine and they were nice; I know by the eating of some of them myself. There were a great many other varieties of very fine looking pears. This part of the exhibit alone was worth going a long way to see.

The apples of Massachusetts are not so good, or, at least, not so fine looking, with few exceptions, as our Maine apples. The Baldwins, Rhode Island Greenings, Snows and many others seemed to spot very badly, more than I ever saw them at home. The Gravensteins and Hubbardstons of Massachusetts are very fine. I never saw any in our own State that were nearly so fine. *I took a specimen of Gravensteins with me from home and it was the best that I ever saw, but when I got there found that I was far behind in that variety.* Of new varieties I saw but one that promised very much, and that was a Russet, which in shape resembled the Worcester Russet. The color was a leathery or a little of the reddish cast. It seemed to be a very fine apple. Flavor sub-acid. The committee gave it the name of Fletcher Russet.

The flowers and plants in the exhibit were very good, especially in the potted plants, of which there was a very large show of large and rare plants. The cut flowers were arranged about the same as we arrange them at our fair, and although not so large a display, perhaps, as we usually have, but being displayed in so large a hall with plenty of room to move around them, they made a very fine show. In the center of the hall there was arranged a lily pond that looked very nice. It was arranged by inserting the stems of the leaves and flowers in bottles and sinking them so that the flowers and leaves would float on the water.

The show or exhibit of farm products seemed to be made mostly by market gardeners, and it was very large and the finest that I ever saw. There was about everything in the vegetable line, also many kinds of corn, beans, peas and grains of most all kinds. One thing I noticed in particular, every article shown in this department was of the very finest quality, not large or overgrown as we usually see at our fairs, but of just the right size for table use, and really about the smallest beets shown took the first prize.

NEW VARIETIES.

By S. G. SHURTLEFF, South Livermore.

So many new varieties of fruit are advertised every year that often it is 'quite difficult to decide what to select. Many nurserymen are not reliable, and, without waiting to test new varieties, often offer them to the public with extravagant recommendations. With occasionally an exception they usually do not come up to the recommendations and prove to be inferior to older and well known sorts. As they always charge high prices for new varieties such nursery companies and their traveling agents, find it more profitable to sell such stock, and generally find the people more willing to buy it. There is too much humbugging done in this business, and doubtless will be so long as so many people are so easily taken in. Experienced fruit growers are shy of new varieties, but the majority of people have to depend upon the recommendation of the tree agent, or of untrustworthy catalogues. How the Jessie strawberry was boomed a year or two ago—which proved inferior to all the older varieties. With me it proved absolutely good for nothing. More new varieties of strawberries are sent out every year than of any other fruit, and nearly all of them prove disappointing. Two exceptions that may be mentioned here are the Haverland and Bubach. The former seems to give general satisfaction in productiveness wherein new varieties usually fail. The Bubach is also very productive, of very large berries. But the claim that has been made, that it is the coming market berry should be taken with caution as it is soft for shipment, and its season with me is too short, not more than half as long as that of the Crescent.

People generally will not take the trouble to lay down raspberry and blackberry canes for protection in winter. Therefore, while quality and size are desirable, hardiness is the most important consideration. There are varieties, which, if shortened back so as to mature the wood, are sufficiently hardy to withstand our winters with the aid usually afforded by the snow. The results of two years' testing of many varieties of raspberries and blackberries by Prof. Maynard are given in the following table, indicating greatest perfection :

	Productiveness.	Quality.	Earliness.	Size.	Per cent winter killed	Remarks
<i>Raspberries.</i>						
Ranococas	6	1	-	4	40	Very good.
Brandywine	5	3	3	5	23	Good.
Belle de Fontaine ..	7	6	7	2	13	
Highly Hardy	8	1	2	6	15	
Criusson Beauty	5	4	2	5	28	
Cuthbert	1	5	9	2	-	Standard market berry.
Hansel	1	2	2	5	35	Profitable
Marlboro	2	5	2	2	52	Firm, profitable, high culture
Golden Queen	5	7	9	2	27	Soft
Caroline	4	3	3	6	12	Very soft.
Turner	5	6	2	7	13	Small and crumbles.
<i>Black Cap.</i>						
Nemeha	4	7	9	5	78	Vigorous
Cromwell	2	3	3	4	-	Promising, vigorous
Hilborn	1	2	8	3	-	Not sufficiently tested.
Thompson's Sweet	6	7	4	5	-	Not sufficiently tested.
Ohio	3	7	3	2	16	Vigorous.
Gregg	1	3	10	1	39	Tender.
<i>Blackberries.</i>						
Erie	5	6	5	2	16	[August 28. Continued fruiting until
Early King	6	3	3	4	-	
Wilson, Jr.	2	8	8	2	25	
Wilson's Early	3	7	2	2	48	
Early Harvest	1	5	1	5	62	
Early Cluster	3	6	1	4	21	
Agawam	5	1	2	3	5	Sweet and quite firm.
Taylor's Prolific	1	3	9	3	10	
Wachusett	4	4	5	5	8	
Snyder	3	3	5	4	9	
Minnewaski	5	7	4	5	20	
Excelsior	8	6	5	8	50	
Lucretia	3	8	2	2	14	Productive, good.

This table cannot everywhere be taken as a standard for productiveness. For many of the varieties will vary much in this respect in different places and on different soils. But for quality, earliness, size and hardiness, it may be considered reliable. Certain new varieties recently offered to the public as something remarkable, according to this table are inferior to the old sorts. The Nemeha which was to supersede the Gregg on account of its hardiness, is put down as the most tender of the lot. The Golden Queen which is now being boomed, is not equal to the Caroline. The Erie and Minnewaski blackberries which are also now being boomed are inferior to older and well-known varieties. The Cromwell and the Hilborn seem to be the most promising of the new varieties. And the Cuthbert

raspberry and the Agawam and Snyder blackberries, well-known standard varieties, still remain near or quite at the head of the list.

I think the cherry is too much neglected in this State. Doubtless the ravages of the black-knot and the depredations of the birds are very discouraging; but there are some varieties not difficult to grow under proper conditions. I believe if it was better appreciated it would be more generally grown. There is no fruit I value so highly for canning, and none that so well retains its flavor when canned. Most of the sweet varieties are rather tender for this latitude. The Black Heart which has hitherto been the only perfectly hardy variety, is a capricious bearer, and in some localities will not bear at all. There has recently been introduced another variety, equally as hardy and an earlier and more reliable bearer. This is the Windsor. Mr. Willard, who seems to be high authority, stated at a meeting of the New York Horticultural Society, that it was the best cherry for both market and domestic use, of the sweet varieties. The Morello cherries are hardy and more adapted to Maine than the Heart or Bigarreaus. The old English or tame cherry and the Early Richmond are as good as any for canning or cooking. Of the many kinds of the Morello class advertised by nurserymen, there are some of very good quality, but they are apt to be shy bearers. There is one promising new variety, however, which is very hardy, very productive, and of quite good quality, and that is the Montmorency Ordinaire. President Barry says it has been tested in many sections of the country, East and West, and is giving excellent satisfaction. One tree set eight years ago by a neighbor of mine, proved an early and abundant bearer. Mr. Willard, referred to above, at the same meeting, said the Montmorency was the best sour cherry for all purposes. The Dyehouse is earlier than the Early Richmond, and is the earliest reliable cherry. It is hardy, very productive, an early bearer, and, when perfectly ripe, of good quality. It is very highly recommended, but it has not been tested in this section to my knowledge. I have trees set two years ago which are doing finely.

Professor Budd has brought a great many varieties of cherries from Europe to test in Iowa. As the climate is as severe in winter in that state as in Maine, some varieties which succeed there, may be desirable here. Some of them have proved hardy even in Minnesota, and they ought to succeed in Northern Maine. Professor Budd says these trees, "have been exposed to the recent test summers and winters that have killed out the young trees of the grade

of hardiness of the Early Richmond and English Morello." The most promising of these are, the Orel, Cerise de Ostheim, Shadow Amarelle, and Spate Amarelle.

Our summers are so short that it is quite difficult to raise grapes in Maine. However, if all the conditions necessary to success are observed, enough can be raised for home use. The earliest varieties, dry soil, a warm, sunny spot, sheltered from northerly winds, vines not allowed to carry too much fruit, and fertilized with well decomposed manure and ashes are the most important conditions. The selection of late varieties like the Concord, Pocklington, Niagara, etc., has done much to discourage grape growing here. The Worden, Brighton and Delaware may be tolerated on account of their good quality, but we want earlier varieties than these. The Janesville is the earliest variety I have now that has fruited, but it is of too poor quality to be generally recommended. Like strawberries, there are many new varieties constantly coming out, and we shall soon have some as early as the Champion and Janesville and of much better quality. Indeed, there are now five or six new varieties recently sent out with great flourish, combining with other good qualities, extreme earliness. These are the Northern Light, Winchell, Cole-rain, Green Mountain, Moyer and Jewel. Making due allowance for the usual exaggeration of the parties who propagate them, I have strong hopes that out of this list we shall find one or more good grapes as early as the Janesville or Champion.

CONDENSED FRUIT LIST.

The high prices received for Maine fruit the past season (1889) in some instances as high as \$8.00 a barrel in the Boston market has given a new impetus to fruit growing, and many people are preparing to extend their orchards by setting more trees. The agents of nurserymen are canvassing in all parts of the State, and from many quarters inquiries come asking what kinds to set? As an aid to those seeking information of this nature it has been thought best to publish a condensed list of fruits in the present volume. It should be borne in mind that while the Society does not urge Maine fruit growers to plant only the kinds enumerated, attention is called to the fact that so far as the apple list is concerned it contains the apples which the past ten years have been found the most profitable in the State. Occasionally some orchardists have found other varie-

ties for local reasons profitable, but when the fruit has gone out of the State, those whose names are followed by a star (*) have brought the most liberal returns. The experience of our best orchardists therefore recommends those which bring in the most money, and their experience so far as contained in the list may be regarded as a safe guide by the inquirers. Those printed in italic are considered the best in quality.

APPLES.

SUMMER—Duchess of Oldenburg, *Early Harcest*, Golden Sweet, *King Sweet*,* Large Yellow Bough (sweet), *Red Astrachan*,* *Russell*, *Tetofsky*, *William's Favorite*.*

AUTUMN—Alexander, *Deane*, *Fameuse*,* *Garden Royal*, *Gravenstein*,* *Munson Sweet*, *Porter*, *Pound Sweet*,* *Wealthy*.

For trial, Montreal Peach, Somerset, Gloria Mundi.

WINTER—Baldwin,* Granite Beauty, Harvey Greening, *Hubbardston Nonsuch*, *Jewett's Fine Red*, *King Tompkins*,* *Milding*, *Rhode Island Greening*,* *Rolfe*, *Stark*, *Talman's Sweet*,* *Yellow Bellflower*, *American Golden Russet*.

For trial, McIntosh Red, Minister.

LATE WINTER—*Northern Spy*,* *Roxbury Russet* *

In the above list it should be borne in mind that the seasons, so far as used with reference to the maturity of the fruit is necessarily somewhat indefinite, since the same variety grown in different parts of the State or on different sites in the same locality actually has different times of maturity. As an illustration of this at this time (May 15th) from a farmer's cellar in Franklin county we received perfect specimens, just in their maturity, of Baldwins. In most localities in the State this variety was past maturity several weeks earlier.

AROOSTOOK COUNTY—From reports received there are several apples that thrive here, among which are Red Astrachan, Duchess of Oldenburg, Fameuse, Alexander, Wealthy, Yellow Transparent. The Dudley is also recommended by those who have tested it.

DESCRIPTIONS OF FRUIT.

NEWTOWN PIPPIN—As there is a general desire for information concerning this variety of apples, which thus far leads all American apples in the foreign markets, we publish below full descriptions

taken from our best authorities. So far as the Committee are able to learn the apple does not succeed well in any part of this State. For experimental purposes it is, however, being set by a few growers, and before many years we hope to be able to record the results. The description is given for information only, as we do not recommend the variety for Maine :

"One of the most celebrated of American apples, on account of its long keeping and excellent qualities, and the high price it commands abroad ; but its success is confined to certain districts and soils. It attains its greatest perfection on Long Island and the Hudson. In Western New York and New England it rarely succeeds well. It requires rich and high culture, and it makes such slow, *feeble* growth that it has to be top grafted upon a strong growing variety. November to June".—*Ellnanger & Barry*.

The Newtown Pippin stands at the head of all American apples and is, when in perfection, acknowledged to be unrivalled in all the qualities which constitute a high-flavored dessert apple, to which it combines the quality of long keeping without the least shrivelling, retaining its high flavor to the last. The fruit is of medium size ; roundish ; a little irregular in its outline, caused by two or three obscure ribs on the sides—and broadest at the base, next the stalk ; about three inches in diameter, and two and a half deep ; color dull green, becoming olive green when ripe, with a faint, dull brownish blush on one side, dotted with small gray specks, and with delicate russet rays around the stalk. Calyx quite small and closed, set in a narrow and shallow basin. Stalk half an inch long, rather slender, deeply sunk in a wide, funnel-shaped cavity. Flesh greenish white, very juicy, crisp, with a fine aroma, and an exceedingly high and delicious flavor. This is one of the finest keeping apples, and is in eating from December to May. This description is abridged from Downing who adds "This is entirely distinct from Yellow Newtown Pippin, which is handsomer in appearance and has a higher perfume. When fully ripe the latter is yellow, with a rather lively red cheek, and a smooth skin. It is hardier than the former."

RUSSELL.—This apple has been traced to the farm formerly owned by Capt. William Russell of Farmington, where it was known to be in fruit over fifty years ago. There is a tradition that Capt. Russell who was an early settler in Farmington walked from Massachusetts to his farm and brought in his pockets a lot of apple seeds. These were planted, and this variety is supposed to be one of the seedlings. The first scions were taken from the tree by Eliab Eaton and later more were taken by James Seales. From these cuttings the variety was mainly disseminated.

The apple has a well established reputation in Franklin county, where it is recognized as superior to any other apple maturing in the

early autumn. It was exhibited at the county fair some years ago, and by some was called "Cole's Quince," since which time by many it has borne that name, locally. But recent committees at the State fairs, say this apple is not the one described by Downing as the Cole's Quince.

The Russell is thus described by President Pope: Large, round ovate, sometimes oblong conical, somewhat flattened at the base, nearly regular; color bright yellow, with a red cheek in the sun, obscurely striped; surface waxy; stalk very short in a small narrow cavity; calyx closed, basin small; core small; flesh yellow, fine grained, pleasant sub-acid; quality best; season September; tree spreading, hardy, an early and regular bearer.

HURLBUT—Origin, Winchester, Conn.; tree very vigorous, and a great bearer; young wood dark brownish red, slightly downy; buds prominent; fruit medium, oblate, slightly conic, angular; skin yellow, shaded with red stripes, and splashed with darker red, and thinly sprinkled with red dots; stalk short, rather slender, inserted in a broad deep cavity, surrounded by russet; calyx closed; basin rather shallow; flesh white, crisp, tender, juicy, mild, sprightly, sub-acid; good to very good; core small; October, December.

BAILEY'S SWEET—Origin unknown, introduced by a New York party; tree hardy, vigorous, upright, spreading, productive. This variety is regarded as profitable for all purposes, although perhaps a little too tender skin for shipping long distances; fruit large, form roundish conical, often approaching oblong, obscurely ribbed; color yellowish, mostly shaded and obscurely striped with red, and thickly sprinkled with minute dots; stalk short and rather small, inserted in a narrow cavity; calyx small, closed, set in a narrow, irregular basin; flesh white, tender, not very juicy, almost melting, with a honeyed sweet flavor; core rather large; very good; November to March.—*Downing*.

FALLWATER—A favorite apple of Pennsylvania of which state it is a native; tree a strong grower and very productive; fruit very large, globular, inclining to conic; skin yellowish green, shaded with dull red, and sprinkled with large gray dots; stalk very short, inserted in a deep cavity; calyx small and closed, set in a slightly plaited base; flesh greenish white, juicy, crisp, rather tender, pleasant, sub-acid flavor; good; November to February.—*Downing*.

STARK—Origin unknown, grown in some parts of Ohio, and valued as a long keeper and profitable market fruit; tree vigorous, upright, spreading; young shoots dark brownish red; fruit large, roundish, inclining to conic, sometimes a little oblique; skin greenish yellow, shaded, splashed and striped with light and dark red nearly over the whole surface, and thickly sprinkled with light and brown dots, a portion of them areole dots; stalk short, rather stout, inserted in a medium cavity; calyx closed; basin rather large, slightly corrugated; flesh yellowish, a little coarse, moderately juicy, mild sub-acid; good; core small; January to May.—*Downing*.

Some confusion has arisen regarding this apple and the Starkey to which reference is made by Mr. Blossom on page 125 of the *Transactions*.

PEARS.

SUMMER—*Bartlett*, *Brandywine*, *Clapp's Favorite*, *Osband's Summer*.

AUTUMN—*Belle Lucrative*, *Beurre Superfine*, *Eastern Belle*, *Goodale*, *Louise Bonne de Jersey*, *Nickerson*, *Seckel*, *Sheldon*.

WINTER—*Beurre d' Anjou*, *Lawrence*.

HISTORY OF THE BARTLETT PEAR.

Mr. Thomas W. Silloway in the *Massachusetts Ploughman*, after years of careful investigation gives to the public the following facts regarding this excellent pear:

I am clear that our Bartlett pear and the English "Williams' Bon Chretien" are one and the same thing. I make no especial claim to this discovery for it has been accepted as a fact for something more than sixty years.

Early in my investigations I became convinced that the pear did not originate with Mr. Bartlett of our Roxbury, and from whom it took its American name, but that it was of English origin and imported.

I am now able to say that such is the fact, and that it has been known there by its English name for more than a century. The words "Bon Chretien" are pure French, meaning Good Christian. There was at the time another pear known as the "Bon Chretien," and that I think was of French origin, and hence its name. Mr. Williams of England as will be seen later on, having presented the new one to the public, gave it his name, a half century later, the same pear in America took the name of its raiser and owner, Mr. Bartlett.

The first notice of the fruit I have been able to find is in the second edition of William Forsyth's treatise on the culture of fruit trees. Mr.

Forsyth was superintendent of St. James and Kensington gardens at London, and died in 1804. In the work referred to, published in 1784, one hundred and six years ago, he says of the Williams' Bon Chretien:

"This is a seedling pear from Williams' nursery at Turnham Green, originally from Berkshire. It resembles the summer Bon Chretien, but it is more juicy; it is a great bearer, and ripens in (August on walls) September. This pear will be a valuable acquisition to the market gardeners as it immediately succeeds the Windsor pear. It is of a large pyramidal shape; the eye not sunk; of a pale green color, spotted with darker green and russet brown, turning yellowish and faintly tinged with red next the sun when fully ripe; the flesh whitish, tender, and full of sweet perfumed juice."

The next information I quote from the "Transactions of the London Horticultural Society." Page 250 of Vol. 2.

"LXV. Account of a new pear (with a figure) called Williams' Bon Chretien; in a letter to Joseph Sabine, Esq., Secretary. By Wm. Hooker, Esq., F. H. S.

"DEAR SIR: I beg leave to lay before the Horticultural Society an account, which I have obtained at your request, of a variety of pear; specimens of which were communicated to the Society in August last by Mr. Richard Williams of Turnham Green, and much approved.

It will be remembered that Mr. Forsyth spoke of it as a "seedling from Williams' nursery at Turnham Green, originally from Berkshire."

The statement of its being a seedling from Williams' nursery, would imply that it originated there, but the additional remarks, "originally from Berkshire," raises the question, which of the two, the pear, or the nursery itself, was originally there. All is yet in the dark, but the "missing link" is found in a work by William Aiton, "Hortus Kewensis," published in London, in 1789, just a century ago. Mr. Aiton was superintendent of the royal gardens at Kew, as early as 1759, and he did much to improve and prepare them as we see them to-day. In the work named he remarks as follows:

"The Williams' Bon Chretien, appears to have sprung from a seed in the garden of Mr. Wheeler, a schoolmaster at Aldermaston in Berkshire, about twenty years ago. It was suffered to remain in order to prove the value of its fruit. Subsequently, grafts have been extensively dispersed, and many trees are now in Mr. Williams' nursery and other gardens about London."

As Mr. Aiton wrote sometime before 1789, and states that the seedlings originated about twenty years before, we have as the date of its appearance not far from 1769.

I now return to Mr. Hooker's letter before spoken of, and in it he describes the fruit as follows:

"The trees of this variety are of vigorous growth and fertile habit; their branches remarkably erect and straight until bent by the weight of fruit. Leaves broad, deep green, very sharply serrated. Fruit, of an irregular pyramidal and somewhat truncated form; large, being

from three to four and one-half inches in length, and two to three inches in width at the widest part near the head. The eye is inserted on the summit and never sunk in a hollow cavity as in the other varieties called Bon Chretien. The stalk is very gross or fleshy, about three-fourths of an inch in length. The color of the fruit is pale green, and russet brown, becoming yellowish and faintly tinged with red on one side next the sun when fully ripe. The flesh is whitish, very tender and delicate, abounding with juice, which is sweet and agreeably perfumed, ripens in August when trained to a west wall, but on standard trees it is three weeks or a month later."

Any person familiar with our Bartlett pear will at once recognize the description as perfect in every point.

At the time Mr. Hooker made his report, which was in 1816, the pear was evidently one few people were acquainted with, and certainly the Horticultural Society had not as yet taken it under its fostering care, and given it its sanction, for Mr. Hooker continues as follows:

"This pear I would recommend to the notice of the Horticultural Society as superior to any of its season with which I am acquainted. It immediately succeeds the Jargonelle, and is earlier as well as much superior to the Doyenne, or White Beurre, and resembles in flavor the Summer Masked Bon Chretien. Its merits over the latter variety are, that on standard trees as well as trained, it seldom fails to produce fruit in abundance."

He next presents a drawing of the fruit, which, I will say, exactly conforms to an average outline of our Bartlett, and he adds:

"The drawing which accompanies this was taken from specimens which ripened on a west wall, and may be considered an average size; but I have seen fruit of this variety weighing from ten to twelve ounces."

I remain, sir, most respectfully and sincerely yours.

WILLIAM HOOKER.

NO. 5, YORK BUILDING, NEW ROAD, November 30, 1816.

As will be observed, this was written about seventy-four years ago, and when it was not a very well known fruit, although as we have seen that Mr. Aiton, in his *Hortus Kewensis*, had spoken favorably of it in 1789, now a century ago, and twenty-seven before we find Mr. Hooker commending it to the favorable notice of his society; suggesting, then, as now, that there is slowness in the movement of "large bodies."

We have thus traced, with considerable accuracy, and a good degree of certainty, the English Williams' Bon Chretien, back to its origin as a seedling, in the garden of Schoolmaster Wheeler at Aldermaston, in 1769. We find in the descriptions given by both Aiton and Hooker, a close resemblance to our Bartlett, and the question for our consideration is this—Are they identically the same, and was that the origin of our pear?

I trust I shall be pardoned the seeming egotism when I state, that being in England the past summer, and having good facilities for examination, I investigated the question quite thoroughly, examining both trees and fruit, and I was fully convinced that the fruit was identical with our

pear. I think there is an absolute agreement. We now take one step more. Mr. Robert Manning, the well-known pomologist of Salem, writing in 1830, remarks as follows:

"I procured in the spring of the present year two trees of Williams' Bon Chretien, one from William Prince of Flushing, who received it from Mr. Bradick, the other from Buel & Wilson of Albany, by whom it was imported from the London Horticultural Society." So it seems that Mr. Hooker's recommendation to the Society had been heeded, and in this year, fourteen later, the venerable Society had aroused from its slumbers, and was dealing in the trees.

Mr. Manning continues, "As soon as the leaves expanded I perceived those two were alike, and possessed all the richness and beauty of foliage which distinguishes the Bartlett, and were so perfectly similar to it in every respect that no person would hesitate to recognize them as the same." Mr. Manning either had his attention called to the fact of this similarity, or had discovered it himself, and considering the fact that he was a painstaking observer, and a constant investigator of matters pertaining to fruit, it is not too much to assume that he himself made the discovery. Not content with the observation and conclusion to which he had arrived, he determined to investigate further, and if possible trace back the Bartlett to its source. He says, "I was told that Mr. James Carter of Boston, had procured trees from England for Mr. Brewer, the former owner of the Bartlett estate in Roxbury. I called on him. He informed me that he was in London about twenty-five years ago, and purchased pear trees for Mr. Brewer, and as his object was to obtain what was then rare and valuable, there can be no doubt that the tree now called Bartlett was in the collection."

Assuming the words, "about twenty-five years ago" to have been a correct statement, then the tree was procured in 1805, eleven years before Mr. Hooker's investigation, and sixteen after Mr. Aiton's notice of it in the *Hortus Kewensis* and about twenty-six years from its first fruiting, assuming for our purpose, that it was a young seedling in 1769, and bore its first fruit ten years later. Of course our data not being clear, we are not sure in our conclusions; enough however has been named to show that it was a new pear, and had received favorable mention by Aiton and Forsyth; that Mr. Carter had procured trees for Capt. Thomas Brewer, and was of the opinion that "the Bartlett was probably among them, as he had endeavored to obtain what was then—in 1806, 'rare and valuable.'"

Now, what was the opinion of Mr. Manning after the further investigation, and perhaps, and probably when he had seen the original tree, and compared it with his own, the Williams' Bon Chretien? These are his remarks:

"In my own mind I am fully convinced. Those gentlemen who may entertain a different opinion will not easily account for the appearance in this country and in England, of two pears so nearly resembling each other in the wood, the leaf, the fruit, and the time of ripening. I would recommend to such as are less confident than myself, to insert buds of both

pears in the bearing branches of the same tree. In two or three years they will find that the best of all summer pears and Williams' Bon Chretien are alike."

From the foregoing I think we may, with a good degree of certainty, make this synopsis.

The Williams' Bon Chretien, and the Bartlett are one and the same. It sprang up as a seedling in Mr. Schoolmaster Wheeler's garden at Aldermanston, in 1769. "Proved the value of its fruit" about 1779, was brought to Brewer's garden in our Roxbury about 1806 by Mr. Carter, and finally no name being attached to the fruit, and being new and valuable, it received the name of its owner, Mr. Bartlett.

Next a few words in relation to the American trees and their owners. Capt. Thomas Brewer, the original American owner, built his house, and improved the estate by making his orchard in 1805. He was lost at sea, in the ship *Laura*, in 1812, while on a voyage from the Cape of Good Hope to Sumatra. Mr. Enoch Bartlett, a well-known merchant of Boston, became owner of the estate, and resided on it from 1822, to the time of his death in 1869. He was greatly interested in horticulture, and was one of the first four vice-presidents of the Massachusetts Horticultural Society. He was in office from 1829—the year the society was formed, till 1839 inclusive; a period of eleven years. As soon as he had purchased the place and discovered the unusually good and even popular qualities of the fruit, he exhibited it. The secular papers of the day make mention of these exhibitions and the great favor with which it was received by persons of good judgment and experience in fruit raising. By common consent of horticulturists, and doubtless well approved by the society of which Mr. Bartlett was an honored vice-president, it took his name, and now for over sixty years has done it honor.

The Bartlett estate was on Dudley street, at Roxbury, and is now the site of the institution of "The Little Sisters of the Poor." The mansion house erected in 1805 was demolished to make room for the new edifice about 1871. There were originally two trees of this pear, one of these died, or was destroyed, and the other at this time of writing, 1890, remains, and is healthy and in bearing condition. It is about ten inches in diameter, and originally consisted of two main limbs, parting from the trunk about eighteen inches from the ground. One of these was broken off some few years ago, leaving the other in good condition, and as care has been taken to properly cut off the splintered wood and otherwise protect it, the prospects are that it has yet a long and useful life before it. The large limb having been taken off, the remaining one receiving all the sap, a new and vigorous growth is being made.

In closing, I feel compelled to make a statement I should prefer not to make, but facts demand it. And it is this. It is by no means true that all Bartlett pear trees of New England or America, as is generally supposed, can trace their origin back to these trees of Mr. Bartlett. The nurseryman had the English Williams' Bon Chretien for sale; Mr. Robert Manning of Salem, the eminent pomologist, informs us, as before quoted,

that as early as 1830 he procured trees from Prince at Flushing, and that he had procured them of Bradick (an English nurseryman) also, that he procured others from Buel & Wilson of Albany. Mr. Manning made pears a specialty, and doubtless freely circulated scions, and trees produced from the original English trees.

As fruit culture in New England received great impulse by the formation of the Massachusetts Horticultural Society, and as Mr. Bartlett was an active vice president, and was in possession of the "new and famous pear," without doubt very many trees were grafted from his, but we must presume that, as Mr. Manning was convinced of the fact that his Bon Chretiens were identical with the Bartlett, he hardly troubled himself to go outside for grafts, but was entirely willing to accept the name Bartlett, as it was being generally received, and by common consent adopted as a new name for an old pear. It is quite an interesting fact, that while Prince and Buel & Wilson, and other nurserymen of repute, all sold Williams' Bon Chretiens, and supplied thousands of gardens, yet the Roxbury name, Bartlett, gradually crowded out the other, and now anywhere and everywhere the original is so little heard of or honored, that explanations are made, and the public have to be informed that the two are identical.

KIEFER—Originated near Philadelphia, from seed of the Chinese sand pear, accidentally fertilized with Beurre d'Anjou, or some other kind grown near it. The tree is vigorous, having large, dark green, glossy leaves, and is an early and prolific bearer. The fruit is of large size, golden yellow, sprinkled thickly with small dots, and often tinted with red on one side; flesh a little coarse, juicy, with a pronounced quince flavor.—*Condensed from Catalogues.*

PLUMS.

Bradshaw, Greely, *Green Gage*, Jefferson, Kingston, *Lombard*,* *McLaughlin*, Moore's Arctic, Niagara, Pond's Seedling, Prince's Imperial Gage, Purple Gage, Rivers' Blue Prolific, Shropshire Damson,* *Washington*, Yellow Egg.

DESCRIPTION OF VARIETIES.

BRADSHAW—Tree an upright, vigorous grower; branches smooth, brownish; fruit large, oval, obovate, sometimes with a slight neck; suture half round, broad, shallow; apex a little sunk; skin reddish purple, covered with a light blue bloom; stalk rather stout, curving, set in a small cavity; flesh yellowish, coarse, juicy, brisk, pleasant; adheres partially to the stone; good to very good.—*Downing.*

NIAGARA—New, origin uncertain; very large, reddish purple, entirely covered with gray bloom; resembles Bradshaw, although a stronger grower, more hardy and far better bearer; vigorous middle of August.—*From Trade Catalogue Description.*

[The above description of the Niagara is published for information only. As yet we are not prepared to state that the Bradshaw and Niagara are identical or not. Many inquiries have been raised regarding them among Maine fruit growers, and pending investigation we publish the most reliable information at hand —SECRETARY.]

GREELY—Mr. S. R. Sweetser of Cumberland Center writes that “The original tree was procured by Captain Greely of Portland from Montreal. The trees in this vicinity have been mostly propagated by root sprouts, which bear the same variety as the original. The plum is purple, resembling the Bradshaw, but larger I think. It is a very prolific tree and were it not for black knot, would be very profitable to cultivate. From the original tree and one sprout from the roots, Captain Greely sold, in one year, seven bushels for fifty-six dollars besides what were given away, which was no small amount. The plum took its name from Captain Eliphalet Greely, who was Mayor of Portland a number of years.”

Mr. O. K. Gerrish of Portland has been introducing the Greely plum for several years, and he says of it, “Having thoroughly tested the ‘Greely,’ both tree and fruit, I believe it to be *the best plum grown*. For hardiness, early and bountiful bearing, size, quality of fruit, etc., I think the Greely surpasses any plum I have ever known. The fruit is very large, freestone, of a rich wine color and delicious.”

[So far as we are able to learn the trees of this variety sent out to Maine parties have not proved hardy, and very few, except those propagated from suckers and scions in the vicinity of Portland, have yet come into bearing.—SECRETARY.]

CHERRIES.

Black Heart, Black Tartarian, Common Native, Early Richmond, Governor Wood, Mayduke, Ox Heart, Rockport.

DESCRIPTION OF VARIETIES.

The description of the Spate Amarelle, Schatten Amarelle, Cerise de Ostheim and Orel, are taken from the bulletin sent out from the Iowa State College by Professor Budd:

“SPATE AMARELLE—Much grown for dessert and culinary use in East Poland and North Silesia where it is noted for its regular and bountiful crops. Tree smaller than the English Morello with pendulous habit. Our trees from five to six feet in height were bending with the weight of fruit this season. Fruit, medium to large, dark purple when ripe. When first colored red the fruit has a bitter taste. At this stage of its growth it is excellent for canning, and when fully mature is desirable for dessert use.”

“SCHATTEN AMARELLE—The word Schatten is said to mean shadow. Hence we send it out as Shadow Amarelle. Much like the above variety in size, shape, quality and season. Trees were laden this the ‘off’ year.”

“CERIS DE OSTHEIM—It fruits earlier and is hardier than what is known as the Minnesota Ostheim, and bears larger, earlier and better fruit. Pitt small; flesh and juice red, tender, juicy, and when ripe pleasantly sub-acid.”

“OREL—Belongs to the Vladimir race with small leaves and close habit. It comes into bearing when from three to four feet in height; fruit larger than the Montmorency, nearly black when ripe, very mildly sub-acid in flavor; promises to be very valuable for the north.”

MONTMORENCY ORDINAIRE—Thus described by Mr. Barry, “French origin; medium size, of a beautiful light color; flesh juicy, melting with just enough acidity to be refreshing; tree makes a handsome growth, and is extremely hardy and productive; about one week later than the Early Richmond; unsurpassed for cooking or canning.”

DYEHOUSE—Origin unknown; found on the farm of a Mr. Dyehouse in Kentucky; fruit medium, oblate or roundish oblate, slightly depressed, without suture, apex, slightly depressed; skin bright red, dark red in the sun; stalk of medium length, slender; cavity, rather large, smooth; flesh, soft, juicy, tender, sprightly, sub-acid, rich; pit, very small; sometimes the stalk adheres to the pit.

WINDSOR—Originated with James Dougall of Windsor, Canada, and is thus described in the *Country Gentleman*. “Tree hardy, vigorous, an early and good bearer. It is a variety of high promise; fruit, obtuse, heart-shaped, dark purple or nearly black; the flesh quite firm, fine in texture and rich in flavor; ripens late, after all other sweet cherries.”

THE SMALL FRUITS.

STRAWBERRIES—*Crescent*,* Downing, Kentucky, Manchester,* *Sharpless*, Wilson. The following are recommended for trial,—Bubach,* Pineapple, Ohio,* Belmont, Haverland,* Cloud.*

Those in *italics* are early, and those marked with a star (*) are pistillate and require some of the perfect-flowered varieties set near them to pollinize the flowers.

DESCRIPTIONS OF VARIETIES.

CLOUD*—The Cloud is pistillate and requires another variety near it to fertilize its blossoms. It is an early berry, of good size, productive, good color, good form and firm, and ripens evenly on all sides at once. As compared with the *Crescent* and *Wilson*, it is earlier, larger, better in quality than *Wilson*, and more productive than either.—*Abridged from Green's Catalogue.*

HAVERLAND*—A new variety of great promise. It is of the *Crescent* class, exceedingly productive, vigorous plant, pale green, large leaves, makes plants fast but not as fast as *Crescent*. The fruit is elongated and quite large and firmer than *Crescent*. For home use and a near market it is highly endorsed.—*Abridged from Green's Catalogue.*

RASPBERRIES—*Red*—Cuthbert, Turner; *Yellow*—Golden Queen; *Black*—Gregg. Ada and Carmen are recommended for trial.

BLACKBERRIES—Agawam, Snyder. For trial, Bangor and native varieties. It is thought by some fruit growers, that the influence of cultivation upon our best native varieties, selected for quality will give us something hardy and of good quality.

CURRENTS—*Red*—Fay's Prolific, Red Dutch, Victoria; *White*—White Grape; *Black*—Lee's Prolific.

GOOSEBERRIES—Downing, Houghton Seedling. Smith's Improved and Industry are recommended for trial.

GRAPES—Brighton, Champion, Delaware, Hartford, Prolific, Lady, Moore's Early. True's Early a Maine Seedling, is recommended for trial.

From T. S. Hubbard & Co.'s pamphlet "on Grape Vines and Small Fruits," we select the names of a few of the earliest grapes, and arrange them in the order of earliness; those printed in *italics*

are regarded by them as the best in quality; the figures refer to hardiness of foliage and vines, the lowest numbers being the hardiest. Several published in their list are hardier but are later, hence none in the list are hardier than those marked "2."

Jessica (3), *Champion* (3), *Dracut Amber* (2), *Moore's Early* (2), *Cottage* (2), *Lady* (3), *Lindley* (4), *Massasoit* (4), *Hartford* (3), *Hayes* (3), *Worden* (2), *Brighton* (4), *Wyoming Red* (2), *Salem* (5), *Delaware* (3).

THE SECRETARY'S PORTFOLIO.

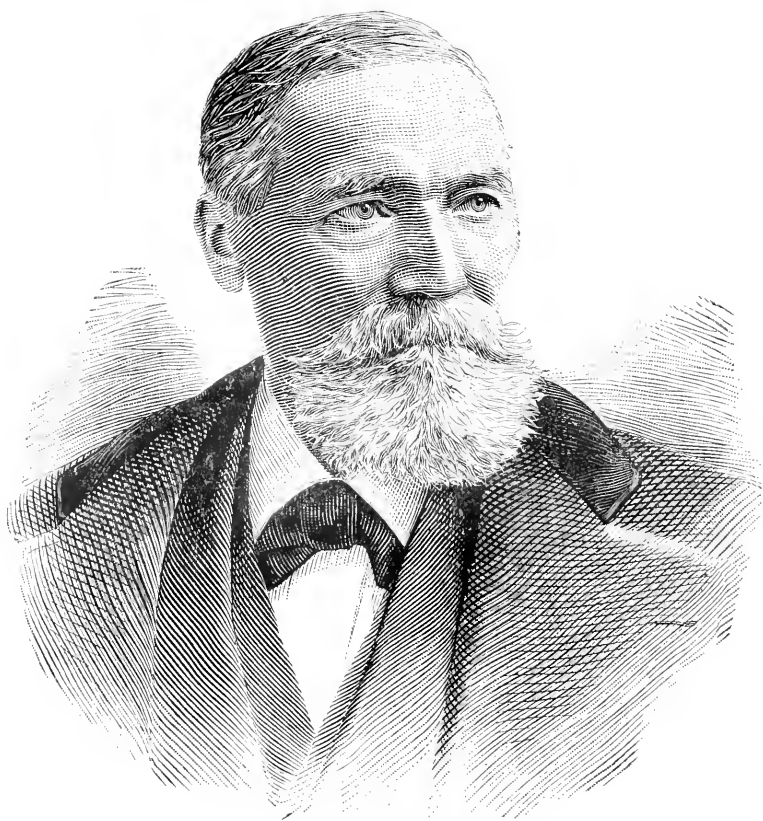
CONTAINING

Original and Selected Scraps, Contributed by Maine
Fruit Growers, and Collected from Various
Sources.

“Spake full well in language quaint and olden,
One who dwelleth by the castled Rhine,
When he called the flowers so blue and golden,
Stars that in earth’s firmament do shine.

“Wondrous truths and manifold as wondrous,
God hath written in those stars above;
But not less in the bright flowerets under us
Stands the revelation of His love.

“Bright and glorious is that revelation,
Writ all over this great world of ours—
Making evident our own creation,
In these stars of earth, these golden flowers.”



PETER HENDERSON.

THE SECRETARY'S PORTFOLIO.

PETER HENDERSON.

Peter Henderson, business man unsurpassed, the beau ideal of what a florist may become; practical, persevering, and with a name unsullied among men, a fluent writer, and a man who has probably done more toward the advancement of the Art of Horticulture in this country than any other one man, has left for all time his desk, his family and his friends.

Mr Peter Henderson was born at Pathhead, a small village about ten miles out of Edinburgh, Scotland, in 1823. He left school at the age of fifteen, having received as fair an education as the schools of Scotland could give at that time, and he was indentured as an apprentice to a gardener for four years. He quickly showed the enterprise and ambition that have characterized his life. For although he commenced his apprenticeship in a company of ten, before he was eighteen years of age he had twice successfully competed for the medals given by the Botanical Society of Edinburgh for the best herbarium of native and exotic plants. This competition was open to the whole of Great Britain. This gave him a practical knowledge of botany, which has been of immense benefit to him as a horticultural writer in after life.

After serving his apprenticeship in Scotland, he emigrated to this country, arriving in New York at the age of nineteen. He worked for one year at Thorburn's nursery in Astoria, Long Island, and another year with the late Robert Buist of Philadelphia. Mr. Buist, Sr., was a life long friend of Mr. Henderson, and he has often said that the man that has since become so prominent as a horticulturist was one of the best workmen he ever had. From Mr. Buist, Mr. Henderson went to Mr. Charles Spang, Pittsburgh, Pa., to erect a range of graperies and greenhouses, and to generally superintend his private grounds.

Mr. Henderson considered that up to that time his prospects were not very "rosy," and a regiment was being raised in the neighborhood for service in the Mexican war. So he made up his mind to enlist, and one day putting his spade in the ground, he went into Mr. Spang's library and told that gentleman of his intention. Mr. Spang turned round to him and said, "Young man, if I mistake not there is something in you that will make you a prominent man in your calling in this land of your adoption. Don't do any such foolish thing. You may think that your prospects and your position with me are perhaps not as good as you have a right to expect; go back to your work, and whenever you have an opportunity to better yourself don't study me in the least."

Mr. Henderson always considered this the turning point in his life, and he never could think enough of Mr. Spang for his kind advice at that time.

He started as a market gardener, in Jersey City in 1847, and for many years this was his principal business; gradually, however, as the taste for ornamental work increased, his early botanical training came in use, and the market gardening part of his business was abandoned. He had already written his famous book, "Gardening for Profit," of which considerably upwards of 100,000 copies have been sold. This book has helped thousands of gardeners and farmers in every state and territory in the Union to comparatively easy and profitable business. Mr. Henderson abandoned market gardening some twenty years ago, and since then placed all his energies into the business of florist and seedsman. His greenhouse establishment now covers over five acres of glass, and on an average 100 hands are employed in this department throughout the year. Up to the time of his death it was entirely under his personal management.

The seed department, which is one of still greater magnitude, is one of the largest and best equipped in the United States. This is managed by his two sons, Alfred and Charles.

Peter Henderson's name, we need hardly say, is perhaps as widely known as any horticultural author in the country. He has been before the public as a horticultural writer for nearly forty years, during which time, besides his books, he has written many hundred magazine articles.

The wonder is that with the large amount of business and the immense quantity of correspondence daily involved thereby, he found time to write so much, but he inherited an excellent constitution,

was extremely temperate in his habits, and possessed the power of quickly deciding on the most important subjects. He, was, therefore, able to do an immense amount of work with comparative ease. It was always Mr. Henderson's unswerving practice to spend two or three hours daily in the open air. A fortnight before his death, he was in his office, and felt a little cold coming on, but did not think it serious. The following day he was laid up with la grippe, but he thought he had got over that, and was able to go out for about ten minutes and take a walk around his grounds in Jersey City Heights. When he came into the house he felt he had got a chill, and had a relapse, which shortly developed into pneumonia. All the aid that human skill and forethought could summon was rendered, but he died peacefully after only a few hours' suffering, January 17, 1890.—*Condensed from Florist's Exchange.*

CHARLES GIBB.

"No man was doing more for his country and ours than he."

We are indebted to Mr. L. Woolverton of the *Canadian Horticulturist* for advanced sheets of that magazine containing a sketch of Mr. Gibb. From this excellent sketch we abridge the following:

"Mr. Charles Gibb was born at Montreal on the thirtieth of June, 1846. He received his early education at Bishop's College, Lennoxville, and went from there to McGill College, Montreal, where he graduated B. A., at the age of nineteen. The application necessary to complete a college course successfully at so early an age, not only injured his eyesight, but also much impaired his health, and he was told by physicians that he had only a few years, perhaps only a few months to live, and they advised him to seek recuperation in foreign travel. This he did, going abroad in company with his uncle for two or three years to Egypt, the Holy Land, and afterwards Switzerland and Europe generally.

"On his return he engaged in the cultivation of fruit, in the State of Pennsylvania, no doubt because he rightly considered it one of the most healthful, as well as one of the most interesting departments of agriculture. The climate of Pennsylvania not agreeing with him, he returned to Canada, and purchased the farm on the slope of the Yamaska mountain, at Abbotsford, so well known to

us all of late years, on account of the interesting experiments with Russian and other hardy fruits which he has carried out there.

“In 1873 he made repeated trips to the United States, studying the pomology of that country, bringing everything worthy of trial to his farm, not merely in sufficient quantities to stock his own farm, but also enough to make free distributions of trees and plants to his neighbors.

“In 1882 Mr. Gibb, in company with Professor Budd of the Iowa Agricultural College, went to Russia in quest of the most hardy fruits which might be expected to endure the extremes of temperature to which the northern parts of Canada and the United States are subject. Professor Budd had already made a large collection of hardy fruits at Ames, but so little was definitely known of the names and values of the various Russian fruits that it seemed necessary that some one should go to Russia charged with this errand. Speaking of it afterward Mr. Gibb, with his characteristic modesty, said,

“‘Northern horticulturists were looking with great hopes to Russian fruits. The work could not be allowed to rest. Some one must go to Russia; Mr. Budd and I went.’

“Mr. Gibb, it is well worth noting, took this costly journey at his own expense. This trip was followed by importations of trees and seeds which were distributed to the members of the different Fruit Growers Associations of the Province of Quebec, and seeds of which were sent to the Experimental Farm, Ottawa, and to the Botanic Garden at Montreal.

“In 1887 he went alone over the same ground, to verify his previous work, visiting in addition, Norway, Sweden and Denmark. Other trips were made in the interests of horticulture to the North-West, British Columbia, California, etc., and in July, 1889, he left for his last one around the world, taking in especially Japan, China, India and other countries.

“Freighted with much valuable information, he was on his way home when his death occurred on the eighth of March last, in Egypt. He contracted la grippe at Aden, which developed into double pneumonia. His remains were interred in the British Protestant Cemetery at Cario, on the tenth, the funeral being attended by several friends.

“Cut off in the prime of life, his life work apparently only fairly begun, he has yet left many works which will be a lasting monument to his memory.”

The following list of books and papers by him are deserving of a place in this brief sketch of his life: "Notes on the Trees and Shrubs of Europe," "Russian Fruits," said to be the best description extant of Russian apples imported by the United States Department of Agriculture in 1870, "Hardy Fruits for the Cold North," "Nomenclature of Russian Apples "

PATRICK BARRY.

Just as we are going to press the sad news of another pomologist's death reaches us. His name has long been identified with fruit growing in this country, and in no one engaged in the propagation of fruit has the public had greater confidence than in the firm of which he was the senior member. The following clipping is from the *Rochester Post Express*:

One of the leading citizens of Rochester, Patrick Barry, has passed away.

For many years he has been identified with the business of the city in various ways, and was as powerful a factor in its growth and prosperity as any individual man might be.

Though he was active in financial affairs, and as one of the owners of the street railway system, which has become the means of keeping all parts of our wide-spread city in easy communication, his greatest work was done in the nursery business. He was one of the founders of a firm which has long taken rank among the largest nursery houses in the world, and so contributed not only to the beauty and prosperity of Western New York, but to the improvement of the whole country. His influence has been felt wherever fruits and flowers are grown.

Mr. Barry was a man of exceptionally strong character. The slightest contact with him elicited some manifestation of personal power. He was straightforward in his methods, honorable in his purposes, and of an integrity that would not tolerate even the suspicion of indiscretion. In private affairs and in public affairs he was a stern, aggressive personality whose influence went always for what was honest, genuine, and true, and in his loss the community loses not simply an individual life but a moral force.

Mr. Barry had great abilities. He was not only a master of business details, a worker of exact habits and untiring industry, and a man of enterprise and financial courage; but he was one equipped

for instruction as well as for action. As a writer on horticultural subjects he was wonderfully clear and interesting, and had a good style, without perhaps ever giving a conscious thought to mere expression. As a speaker on any topic, he was forcible and fluent; but he seldom spoke except for instruction and never for display.

He was successful in accumulating a large fortune, but it may be said it was a fortune in the collection of which every dollar gained for the individual represented many dollars' worth of good done. He prospered on the plunder of no other man, but on the prosperity of others—on the improvement of land in all parts of the country, and on the growth of this community. He made himself wealthy, but he left the world far wealthier through his labors.

FRUIT-GROWING IN AROOSTOOK.

As I looked over the fine specimens of fruit on exhibition last winter I became more interested in fruit growing than ever before, although at first thought it would almost discourage any one from Aroostook county, seeing those fine varieties of apples so delicious to the taste, and to think it would be impossible for us to try to raise them in our county; but I have all the courage in the world to believe the time is coming and is not far off when we can raise plenty of good fruit to carry us through the season. In 1858 we came to this county from the town of China, Kennebec county, there we had plenty of fruit. We boys missed that more than anything else. They told us then that we never could raise apples here. At that time there were a very few native crab-trees and once in a while you would find a hardy seedling that would make a pig squeal if he ate one. But in a few years there was a change. They told us we could raise the Duchess of Oldenburg. We tried a few and they stood our winters first-rate. Some other kinds did quite well. The Fameuse and Alexander and Tetofsky, and they were shortly followed by the ironclad Wealthy from Minnesota, also the Yellow Transparent and Montreal Peach; then came the Dudley apple, which keeps nice until April. The tree is an ironclad and a very prolific bearer. I have several other varieties that I am testing, among them is a sweet russet, an apple of very fine quality and a good keeper. There are seedlings in Northern Maine and New Brunswick that are worthy of propagation, and I believe if thoroughly tested would give us fruit the year round and of fine quality, good enough for a king. Knowing these things and having the experience

of such men as Mr. Gideon of Minnesota and Dr. Hoskins of Newport, Vermont, I think we have every reason to feel encouraged in fruit raising in the cold north.

Ironclads grow finely in our section. I am preparing to set more and intend to make a specialty of fruit raising. If there is any money in it, I think the place to begin is where they are obliged to import nearly all they use, for if we raise less fruit we can get higher prices for it. We are now obliged to pay freight on our apples from the older parts of the State. So, instead of leaving our county and going to the older parts of the State to grow fruit, I say stay here and use what opportunities we have and I am sure we shall succeed.

J. W. DUDLEY.

Castle Hill, Aroostook County.

The varieties of apples that have done well with me, are the Duchess, Alexander, Fameuse, Red Astrachan and Wealthy. I raise a few other varieties, but those named do the best. The Dudley trees are not on the market yet. I have watched the original tree since it first fruited, and have great hopes concerning it.

Of course there will be other choice varieties originate here as there are many seedling trees not yet come to bearing.

The same variety raised here will keep later than when raised farther south, and in some cases, notably the Duchess, the quality is better. My Alexanders are at their best now, (December 10th.)

There are many trees being set in this county the last few years, and as the farmers are using more care in selecting varieties, and in caring for the trees after planting, we have faith that more fruit will be raised here in the future than in the past.

EDWARD TARR.

Castle Hill.

THE WEALTHY FAR NORTH.

We have felt a deep interest in the results of the trials with the Wealthy apple in Aroostook county, and are pleased to note that up to date, in all localities where planted, it is proving hardy enough to stand the rigors of that northern section. Mr. James Nutting of Perham, a town located on a parallel with Caribou, and as far north as fruit trees have ever been tried at any point in the State, has a large orchard of them growing, and which has already commenced bearing. He reports that it proves perfectly hardy, not a tree among the large number planted having shown any signs of winter

killing. Side by side with the Duchess, it stands the climate equally well with that world famous ironclad. In so short a season as that of 1888, Mr. Nutting reports that the fruit did not have time to ripen up into its full perfection of flavor, though the growth and size were entirely satisfactory. The past season, however, 1889, the fruit attained complete perfection, and in every way appears to be equal to that grown in lower latitude. A specimen grown by Mr. Nutting measured twelve inches in circumference, and weighed ten ounces when it came off the tree. This variety grown in that northern section keeps well through the winter. Should further experience corroborate the present success with this variety, the people of that locality need not feel very bad if their list of varieties is narrow. The Wealthy is a fruit of high quality, both on the table and in the cook-room.—*Maine Farmer*.

THE APPLE-TREE BORER.

This pest is very common in Maine, and one that demands constant care on the part of the orchardist. There are two varieties of this pest, round-headed and flat-headed borers. The latter is the one of which I will speak as his work can be detected in the winter season when the snow covers the ground. The damage is on the trunk of the tree where it can be seen. The borers commence their destructive business on the sunny side of the trunk and if the tree leans to the north or crooks so that the rays of the sun strike directly upon the tree, there is the place where they will be found. The damage done by these borers is very often attributed to sun scald. Sun scald to injure would affect the inside of the bark; but this will not be found to be the case, if the damage is caused by this insect, at least for quite a while. One man, whose trees were very much injured thought the injury was caused by the oil from the wool of sheep that were pastured among the trees, but a close examination convinced him of the true cause of the trouble. This trouble must not be confounded with canker which will attack the north side of the tree as soon as the south. Trees are never troubled by this borer when the trunk is well shaded. If the borer is not destroyed it will eat into the wood, and others will be lodged around the first colony and will continue to spread until the tree is destroyed. The beetle makes its appearance early in the summer, and lays quite a quantity of eggs, and for this reason one of the best remedies is to

keep the tree smooth by good cultivation, and scrape off all moss and flakes. If the tree shows any signs of the work, shave the bark slightly so as to destroy all that may be lodged there.

Of the round-headed borer, that does its work very near the ground, and cuts down and destroys very many trees, not so much may be said of him at this season of the year, for his work is hidden for the present and also is better known by most that have the care of trees. In his operations he dislodges large quantities of sawdust, and unlike this cousin, the flat-headed borer, is not confounded with other troubles. After close observation I think real cases of sun scald are very few.

D. P. TRUE.

Leeds Center.

HOW SHALL WE MAKE OUR ANNUAL EXHIBITIONS MORE USEFUL?

By W. P. ATHERTON, Hallowell.

Only a few points will be presented and those very briefly.

First, simplicity of arrangement. This will be accomplished best by having ample space for the tables, so that visitors as well as exhibitors shall have free passage around them; the tables themselves should not be crowded with fruit, but ample space given to every exhibitor, and under no circumstances in a general collection—competitive of course—should the duplication of varieties be allowed, and except as wherein allowed by the rules of the Society should a plate contain more than five specimens of apples. If, from a want of space tables are crowded with plates, and plates themselves are crowded with specimens, confusion will arise, mistakes occur and those useful lessons sought to be obtained by a careful study of the different specimens will be lost.

Second, all abnormal growths in either fruits or flowers should be ruled out entirely, or in *some* way discouraged. A premium should *never* be awarded to an abnormally grown specimen. If it *is*, the effect will be to discourage all honest efforts. But *how* shall we distinguish between normal and abnormal growth? I know of no other way than by having a correct knowledge of what constitutes a healthily grown specimen. A good gardener *ought* to know whether a big pumpkin or squash has been fed on buttermilk or has derived its growth wholly from natural sources. A good orchardist *ought*

to know whether a Northern Spy or a Hubbardston has had fair honest orchard culture or has had the contents of a privy or a pig-pen or a hen-yard to feed upon. When specimens grown under these or any other *extraordinary* conditions are awarded first premium as I have known them to be, the useful lessons which the Society would teach by its annual exhibitions are of doubtful utility to say the least.

Third, varieties of fruits, which are really excellent but which unfortunately have but a local reputation, should in some way receive greater recognition. Allow me to suggest that possibly this might be brought about by setting apart one table for purely local varieties and offering a small premium or medal for the best individual display. Again, I am not sure but that the interests of our Society would be best subserved by doing away with all cash premiums and adopting instead a reward in diplomas or medals.

Lastly, our Society would do a good work by offering some encouragement to the originators of new fruits. Let the Society offer a gold medal to the one who shall originate and exhibit for five or ten years, the best summer, autumn and winter apple or pear, and a greater interest in our annual exhibitions will at once arise and a better knowledge of fruits be disseminated.

THE SCHOOL GARDEN.

The school garden should be a place for observation and experiment. Budding, grafting, various ways of propagating, cross-fertilization, and conditions favorable to plant growth could be taught by seeing and doing. Much of this kind of work is already done by the pupils of the George Putnam school in Boston, which includes the work of drawing from natural specimens and making original designs. These pupils are learning to see as never before, and are acquiring facility and power in representing objects that will add much to their usefulness and happiness and are working toward horticulture. Their written descriptions and drawings of wild flowers serve the legitimate purpose of the school work and continually suggest nature.

What an influence for horticulture might be felt if the common schools throughout the country should make good use of school gardens. The ordinary Sahara-like school yard could be made to look like a paradise. Representatives of the various classes of vegetation could be grown, the flora of the vicinity could be obtained and

for every purpose the school would serve better than cultivated flowers. The effect on the health of the children would be beneficial. Why not convert gymnastic wands into garden hoes?

A large majority of our public schools have done little or nothing for the study of plants, insects, minerals and soils, alleging that such study is not practical, but the conning of books and the figuring on slates they claim to be practical. What is the opinion of agriculturists? Are not potatoes and wheat practical things? Is there anything theoretical about the potato bug and currant worm?

The right kind of men should be placed upon school committees and teachers secured who are known to have an interest in horticulture. The collection and study of native plants is especially interesting and instructive to teachers.

The address closed by urging the Society to offer premiums for school gardens.—*Henry L. Clapp, before Massachusetts Horticultural Society.*

GARDENS FOR SCHOOLS.

During the last ten years the State of Austro-Hungary has reserved ground in connection with each school to be used as gardens, where boys and girls may have an opportunity of growing plants from seed. The expense connected therewith has been defrayed by the state.

We think it might be well for America to emulate this foreign state in this one respect. "As the twig is bent so the tree inclines." To foster and encourage a love for the growing of plants by children at our public schools, would in our opinion tend to elevate the moral standard of the people generally, for the man rarely amounts to anything who hates music. the laugh of a child or the cultivation of flowers. In cities like New York, it might, perhaps, be somewhat difficult to obtain a plot of ground with each school for this purpose, but in the country there need be no such difficulty. There are several seedsmen, who make a specialty of seeds for boys and girls who choose to devote some of their spare hours to horticulture.

We should be pleased to know what the great brotherhood of florists have to say on this subject, and whether any of them can stir up the powers that be, to do something towards initiating a course of horticultural instruction at our public schools.

MAINE FRUIT AT THE BAY STATE.

It was a capital idea sending samples of Maine apples to the Boston exhibition, and the Pomological Society is entitled to compliments on its enterprise. The collection made a fine showing, not only in itself, but also in comparison with the Massachusetts samples, as the many premiums taken fully testify. It is to be regretted, however, that more time could not have been given to the matter and a more complete list of varieties grown in the State made up for the tables, and in case of some of the kinds, larger samples selected. The plate of Baldwins, for instance, while perfect in form and coloring, were not so large as could have easily been selected and with equal perfection, while several of our choice apples, native to the State, were not in the collection.

It was no small honor to Maine fruit that we should carry off the highest honors on dish of Kings in so strong a competition and with one of the most popular fruits in the whole list, as this kind through its fine color, high quality and large size has now become. E. H. Keniston, Dixmont, grew the samples taking the honors. Mr. E. W. Wood, the superintendent in charge of the fruit tables, well and widely known in connection with the Massachusetts Horticultural Society and chairman of its fruit committee, paid us the high compliment of admitting that Maine can grow more perfect fruit of this justly popular variety than can be done in that State; and he further stated that it was conceded that although the Baldwin was a native of that State, yet Maine grown Baldwins were superior to those produced in its native locality. The superiority of Maine apples is chiefly in their perfection. While selected samples hardly run as large as those grown in Massachusetts, yet in freedom from imperfections in coloring and in that gloss and finish which renders our Maine apples so attractive in appearance, as well as in firmness and flavors, our Maine fruits are not matched by anything grown in more southern latitudes or on lower altitudes. This could have been further proved by numerous varieties not on the tables at Boston.

But our parent State can beat us out and out on pears. Of the later kinds there was a fine display. The most remarkable showing, however, were the nineteen platters of Duchess, varying so little in size that the committee had to resort to the scales to place the premiums. The extremes in the prize dishes, twelve specimens, were thirteen pounds and fourteen ounces for the first to twelve and three-

fourths pounds for the third. Just think of grappling a Duchess pear weighing a pound and a quarter!—*Maine Farmer*.

The fruit display was exceptionally fine, notable among which contributions was that of the Maine State Pomological Society, which was represented by Mr. Henry W. Brown of Newburg, Me.—*Roxbury Gazette*.

The Maine Pomological Society is entitled to thanks for its enterprise in sending an exhibit to the Bay State fair and also for its thoughtful spirit of fraternity.—*New England Farmer*.

TRANSPLANTING HERBACEOUS PERENNIALS.

A good portion of the hardy herbaceous perennials, if properly cared for, can be transplanted with better results in the latter part, or even the middle of summer than late in autumn. Early flowering plants, which start into growth as soon as the snow is off in spring, make their preparation for this the previous autumn. If we will examine closely our beds of such early plants as the Trilliums, Claytonias, Early Anemones, etc., just before winter, we will find the flower buds for the coming year well formed, ready to start into growth the moment spring arrives. The middle or last of August is not too early to set such plants. It is much better to set them early, so that they can make their autumnal growth where they will remain through the winter, than to transplant them just before winter. There is always more or less loss of fibrous roots in lifting such plants, and, when the transplanting is done early, the plant can recover before winter.

It frequently happens that the driest part of the year comes at this time, and, if such is the case, sufficient moisture, which is very necessary, should be artificially supplied until the plants become well established.

Most of our bulbs for fall planting do better when set early. A new growth of fibrous roots is formed, which enables the plant to start sooner and stronger in the spring. We have had better success with lilies which were planted early. In fact, we prefer wintering them in a cool cellar to a late setting. Many plants, especially lilies are greatly reduced by seed-bearing. Plants of *L. Canadense*, taken up while in flower and the bulbs then replanted,

will give better blooms the following year than if left to seed in their original location. The same may be said of others. As soon as the seed vessels begin to form there is a great demand upon the bulb. Those who do not allow their lilies to go to seed will get more and better flowers the next season.—*Garden and Forest*.

SHRUBBERY IN NEW ENGLAND.

We plant for the summer only, while our cousins over the sea plant for the whole year. Some will reply to me that we have few good evergreen shrubs fit for our climate, or broad-leaved evergreens, such as rhododendrons, laurels, etc. I reply to all such that we have the finest ones in existence, growing wild in quantities, and we have overlooked them for so much of our national existence almost wholly, while Europeans have always used them with lavish hand, and our own native broad-leaved evergreen shrubs, the lack of which leaves our lawns so barren looking all winter, are the very plants that make England's gardens so rich and so constantly green. Two species of rhododendrons, of absolute hardiness and superb beauty, three of kalmias, one of them our lovely mountain laurel, two native hollies, are all evergreens, and should be found in thousands in the gardens of New England. Of these seven species, the first two and the mountain laurel are the best, and would serve all necessary purposes, and their free and general use would so metamorphose our shrubberies, now leafless so long, that one would soon fancy himself in the green shrubberies of the mother land. Why do we not appreciate our own unequaled native shrubs? Why should we cross an ocean to see places made famous by beauties derived from generous use of American plants which grow wild and unconsidered here at home? The sensible man who should plant his spacious grounds with these charming native shrubs in a really liberal way would not only have in time the finest grounds to show, but be a public benefactor and educator—*F. L. Temple in Boston Journal*.

THINNING FRUIT.

The practice of removing the surplus fruit from trees which have ambitiously undertaken more than they can properly perform without injury to the present crop, and permanent injury to the trees themselves in many cases, is an operation which needs only a careful,

thorough trial to commend itself to all painstaking fruit growers. Many who acknowledge that the crop after thinning will sell for more money per tree than if not thinned are still unwilling to admit that the gain will pay for the extra labor involved. Well, about how much for time is required to remove 500 apples, pears or peaches in June and 500 more in October, than would be occupied in picking the entire 1,000 in October?

Further than this, it is a well-known fact that the production of the seed of a fruit causes by far the greater draft upon the vitality of the tree than the formation of the pulp surrounding it; also that 1,000 small apples will contain nearly twice the weight of seeds found in 500 specimens double their size of the same variety, and thus be much more exhaustive to the tree. An incidental benefit which may result from thinning of fruit: The horticulturist may, in thinning the fruit, notice many young shoots that by pruning-time next spring will become stout limbs to be cut off; whereas now they may be easily rubbed off, while the plant-food required for the formation will be saved for the tree and fruit.—*Popular Gardening*.

TOO MANY KINDS OF APPLES.

The mistake that most every orchardist or fruit-grower makes is that of setting out too many kinds of fruits. It is well to have different kinds enough to supply a succession of fruit throughout the year for home use; but for market purposes the varieties should be few, and those of the best and most salable kinds. The greater part of the different kinds of apples raised in any one locality might be termed local varieties, not well known to the trade. The Baldwin, Rhode Island Greening, Roxbury Russet, Northern Spy, Fameuse and a few others, are the best known to the trade generally, and in localities where they flourish, are safe to raise. The Baldwin, for productiveness, profitableness and salability, stands at the head of market varieties. In sections where it thrives, more money can be made from it than from any other apple. Baldwin trees will produce more apples, with fewer of second quality, than any other variety. Two or three varieties are sufficient for a large market orchard.—*Exchange*.

THE ROLFE APPLE.

This fine Maine apple, regarded as equal to the Gravenstein in all points, and a month longer keeper, is a round, smooth, regularly shaped fruit, striped, splashed and almost covered (on a light yellow ground) with pale red, brightest in the sun. It much resembles the Gravenstein, though larger and more regular in form. The flesh is delicate and crisp, with a rich melting flavor, sprightly and juicy, and in my judgment it is nowise inferior to Gravenstein. As a later apple, so close in all points of resemblance, and so considerably prolonging the season, it strongly recommends itself to orchardists who seek to supply the market for "fancy" fall fruit.—*Orchard and Garden, December, 1889.*

IN OREGON.

One of our life members, James A. Varney, now President of Second Eastern Oregon District Society, The Dalles, Oregon, writes under date of January 16, 1890:

"We are having snow this winter enough to secure good crops another year, no severe weather yet. We look for good fruit crop next year. The past year's crop was large in fruit, but injured by drought and codling moth. It has come to this, that he who sprays not will reap not in Oregon. Our long dry seasons give us bugs all the way from April to November. Good sound apples are retailing to-day in this city at \$3 per box (40 pounds), and Eastern apples are selling in Portland market to-day notwithstanding they may be grown much quicker and cheaper than in Maine."

The apple is one of the best fruits. Baked or stewed apples will generally agree with the most delicate stomach, and are an excellent medicine in many cases of sickness. Green or half ripe apples stewed and sweetened are pleasant to the taste, cooling, nourishing and laxative, far superior, in many cases, to the abominable doses of salts and oil usually given in fever and other diseases. Raw apples and dried apples stewed are better for constipation than liver pills.—*Hall's Journal of Health.*

Some of our desirable old apples are no longer reliable, and we have no substitutes possessing their peculiar rich flavor. Newtown Pippin, Bellefleur, Rambo, Pennock, and some others, are good examples. Is this degeneracy, or lack of proper nutriment in the soil? Facts leading to the latter hypothesis crop out frequently. All the above-mentioned varieties show their appreciation of high culture, by improved yields, which if not equal to the "good old times," are certainly superior to the average fruit of our uncultivated orchards. —*N. Y. Tribune.*

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